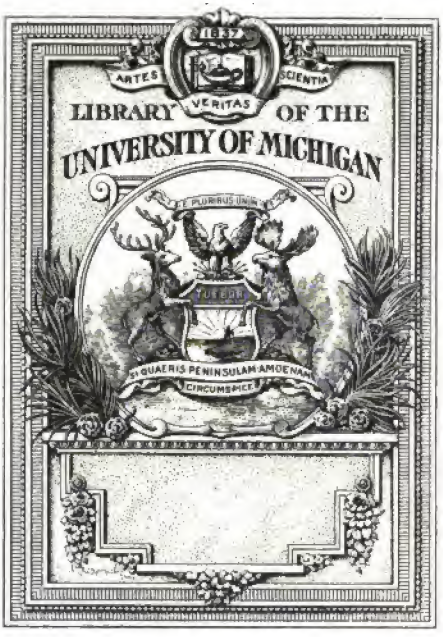
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THE ROUTES

AND

MINERAL RESOURCES

OF

NORTH WESTERN CANADA.

BY

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PREFACE.

In my capacity as Honorary Secretary of the Incorporated London Chamber of Mines (with which is affiliated the Canadian Chamber), I have had continuous occasion to remark the need of an abridged hand-book upon the mineral resources of North-Western Canada.

The gold discoveries in the Upper Yukon Country have made this want even more keenly felt, for it is believed that throughout the vast expanse of the Northern Dominion there are innumerable openings for the intrepid mineral explorer with the fascinating possibility of many "Klondikes" awaiting the pick and pan of the adventurous pioneer. Meanwhile millions of many nations that have heard the name and news of "Klondike" are eager for more information of the Great Territory of which this newest marvel in goldfields is but a spot.

Shaping my efforts by the numerous enquiries that have come before me, I have endeavoured to compile a work to meet the demand, and have embodied other necessary information that I think will interest those concerned.

The chief consideration, after ascertaining the existence and locality of payable minerals, is how to reach them. A considerable proportion, therefore, of this book is devoted to the question of routes. On this subject, for obvious reasons, I write from the point of view of a resident in England and show that there are many routes into the N. W. Territories and the Yukon from the East and South East which are, perhaps, superior to those from the Pacific Coast. This question, together with Mining Fields being developed and those prospective, is dealt with in Part I.

Special attention is drawn to the Mackenzie River and Bay, for the discovery of an evidently immense tract of gold-bearing Country in the Mackenzie-Yukon lends a deeper interest to the value of Mackenzie Bay by making it a means of opening up a Commercial route to the Bay by way of Behring Straits and the Arctic Ocean. Its superiority over the Yukon River Route is also

pointed out. Dr. Dawson's views—that Mackenzie Bay will one day serve British North America as the White Sea serves Russia will, doubtless, soon become fact. The illimitably rich resources of this huge territory reached by the Mackenzie, Peel and other rivers flowing into Mackenzie Bay are indicated, as also are the advantages of a direct route from Hudson's Bay through Chesterfield Inlet, or from some other point leading from this great arm of the sea.

Part II. and the Appendix consist wholly of a classified digest of the chief works of reference, books of travel and exploration, recent reports and other publications of the N. W. Territories together with extracts from various official reports, leading newspapers and expert authorities upon the resources, chief waterways, routes and distances around and throughout the far Northern Dominion, and more particularly of the Yukon-Mackenzie Country and the means of access to that region.

I would direct special notice to the accompanying map which is based upon the most recent information and discoveries, and has received the best attention of the Publishers.

Whether this book fulfils the object with which it is written or not, I shall be quite satisfied if it directs some attention to the splendid work of the Geological Survey of Canada under the brilliant directorship of Dr. G. M. Dawson, to whom I must acknowledge my chief indebtedness. Nor can the name of Mr. Wm. Ogilvie be omitted in any present day work on Canada's Mining Industries: a name, practically, synonymous with the World's greatest goldfields, whom the "Times" (London) describes as a man of indomitable courage and sterling integrity, whom the "Toronto Globe" names "The Modern Cato," to whom thousands of Miners will owe more than they can ever repay and to whom this Book's greatest attraction is due. The many others to whom I am indebted are mentioned below along with such publications and special reports as I have quoted in Part II. and the Appendix, and to some extent in Part I.

E. JEROME DYER.

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THE

ROUTES AND MINERAL RESOURCES

OF

N. W. CANADA.

PART I.—ARGUMENT.

UNTIL a few months ago the Canadian Dominion was chiefly known, written about, and lectured upon as a country of great and promising agricultural capacity, excepting that portion west of the Rockies known as the province of British Columbia, which enjoys such world-wide repute as a country of well-nigh illimitable resource in its mining, agricultural, pastoral, timber, and fishing industries, as to need little more than passing reference in these pages.

Well-informed people, however, had kept themselves posted up in the reports of the Dominion's ably conducted Geological Survey, and were aware of the boundless stores of mineral wealth, only awaiting man's enterprise and ingenuity to locate it and his energy to unearth it.

What has hitherto prevented mining development.

There were, however, many circumstances which prevented mineral exploitation, but the most potent hindrances were the inaccessible character of the country and the want of a prospecting community. Means of access would soon have been forthcoming had a pressing demand arisen, but this could only be provided by population. The steady growth of an agricultural people could not supply this want, it required the colonizing influence of gold discoveries.

The majority of mining men are rovers; here to-day, Australia to-morrow—so to speak—and South Africa the next day. Had it not been for the gold-mining attractions

of the last-mentioned countries, following those of California fifty years ago, this roving band of adventurous men would long ago have turned their attention to this most promising land, and brought it well on to the high road of mineral development, instead of it being as it is to-day merely in the groping stage.

The first and following mining developments.

On the decline of the Californian diggings the miners gradually scattered and many found their way into Canada, chiefly along the Columbia and Fraser Rivers, and in the late fifties the placer mines of Cariboo became known. These were followed by the Cassiar "rush," and ultimately led to the discovery of magnificent gold-bearing quartz in Kootenay, where a large amount of British capital has been invested during the last two years.

As the Cassiar placers were worked out miners drifted further west and north, prospecting on the Dease and Liard Rivers, and along the Lewes into the Yukon district. Others sought the snow-bound regions of Alaska, ultimately finding their way on to the gold-bearing tributaries of the Yukon River. The wonderful discoveries on the Klondyke creeks of 1896, and last year, '97, are the result, and are believed by the highly qualified officers of the Canadian Geological Survey and other experts, to be the very probable forerunner of greater and richer discoveries in that immense gold-bearing region between the Yukon and Mackenzie Rivers which Dr. Dawson describes as occupying a total approximate area of 192,000 square miles. (See Section 1. Part II.)

A matter of the highest importance to commercial men.

The prominence which this vast region will occupy amongst the gold-bearing countries of the world, and the important position it will take in the eyes of the world's commercial centres, may be gauged by the facts that the above-mentioned area is nearly equal that of France, and greater than the United Kingdom by 71,000 square miles, and that almost all supplies must be imported, as the soil and climate are unsuited for any appreciable agricultural production.

The colonising power of gold discovery.

A considerable proportion of the North-Western Territories of Canada may be unquestionably termed sub-arctic, but in this hitherto shunned region there is every reason to believe the proud and promising Dominion will find its greatest source of wealth. But what cares the gold-seeker for snow-swept plains and ice-locked streams? These obstacles may throw him back beaten and bruised to-day, but the sesame "gold" brings him back undaunted on the morrow and passes him through. Countless numbers follow on his track and the history of a new country, possibly a nation, begins. The story of California, Australia, and South Africa is again repeated. Such is the colonising power of gold discovery.

Present wealth and future prospects of the N.W. Territories.

The permanency of this new field will depend upon the existence and value of quartz reefs which all experts declare must exist to great extent in close proximity. It is reasonable to believe that the value of these reefs will be in proportion to that of the adjacent placers, the extraordinary richness of which is vouched for by the highest authority on the district—Mr. William Ogilvie, who has repeatedly declared that out of two Klondyke creeks alone—the Bonanza and the El Dorado—£15,000,000 worth of gold will be taken, and that Canada has in the Yukon district 100,000 square miles over the whole of which rich prospects have been found. But Mr. Ogilvie also reports having tested quartz reefs in the neighbourhood which yielded gold at the rate of 1,000 dollars worth to the ton. Inspector Constantine, chief of the police during 1896 also reports the country being full of quartz ledges more or less valuable, and that the best paying streams are those which, rising in the Rocky Mountains, run into the Yukon from the East. When to these official statements is added that of Dr. G. M. Dawson, the chief of the Geological Survey of Canada—"the entire range of the Rocky Mountains extending to the Arctic regions is rich in minerals," and referring to the rich Klondyke placers—"where such large deposits of heavy placer gold have been found there must have been at some time large quantities of gold in quartz at no

very great distance and these quartz veins still exist," (see Section 2. Part II.), one's eyes are opened to a long and widening vista of future possibilities for the North-West Territories.

The great future of the region.

It must, consequently, be taken for granted that the Western side of these sub-Arctic mountains—on the tributaries and at the headwaters of the Lewes, Yukon, Pelly, Macmillan, Stewart, Peel, Porcupine and other rivers—will be the scene of great activity in years to come, when the glens and mountain passes of this wild region will resound with the whirr and thud of mining machinery and the strident march of civilisation.

It is quite reasonable to suppose that the Eastern side of these far Northern ranges may also be found equally rich as is the case further South in the neighbourhood of the Liard and other adjacent rivers, and still further South in the States. And in the pursuit of the yellow metal are there not in this region vast stores of other concomitant products such as coal and iron which may open up such a field of industry in this far North-West Territory as not even the most sanguine has dared to forecast?

The question of access.

The question of access, as has already been pointed out, has been one of the obstacles to mineral exploitation of North-West Canada in the past. But the solution of this matter only awaited the striking of a note in a certain key and all difficulties surrounding the question became mere details to be summarily swept aside before The Great Purpose. This key note was struck in California fifty years ago when similar difficulties were dealt with as drift before a cyclone. One of these difficulties was a 2,000 mile waggon journey through an unknown country that was not only heartbreaking in its trials, but was infested with robbers and hostile Indians who ravaged, murdered and despoiled in a manner sufficient to terrify the most courageous, excepting those lured by the keynote—gold.

The great key note—gold.

This keynote was next struck in Australia, and 13,000 miles of what was then considered a desperate and

perilous voyage was undertaken by scores of thousands without a moment's hesitation. New Zealand, Mexico, Columbia, South Africa, West Australia—all countries where trials had to be endured—each struck this irresistible keynote, and a new era of prosperous development set in for each. Great cities arose, costly railways were built, manufactories were established and splendid fortunes were made; the countries were developed. The richer and more permanent the fields the greater the development, and the more magnificent the cities and industries.

A splendid future of mineral development.

With these examples before us there is every reason to anticipate a splendid future of mineral development for the Canadian North-West Territories, now that the magical keynote has been struck in the Yukon, and with this a development of trade, manufacturing and agricultural production which will not only bring wealth to the Dominion, but will give this great British possession a position in the world which will qualify it to play no unimportant part in those questions which concern the world's welfare.

Mining Fields now being Developed.

Before dealing with the important question of means of access to the Yukon and other far distant portions of the North-West Territories, a brief reference might be made to the mining fields of the Dominion now being worked, and those that might be termed prospective.

British Columbia.

(See, also, Appendix).

First discovery of gold and subsequent work.

Gold was first discovered in this province early in the fifties, following the great Californian rush of 1849. At first, and for many years, it was nearly all *placer* or alluvial mining in valleys on the banks of rivers or along old creek beds. Splendid returns were made on many occasions and there were several "rushes" to different parts of the country. In the year 1863 gold to the value

of £800,000 was taken out of British Columbia placers, but from about that time returns declined until in 1893 the annual output was valued at only about £70,000. About 1890, however, quartz mining, under modern methods, was introduced and a new era in the industry set in for the province. The Cassiar and Cariboo fields have not yet been exploited for quartz and are still being successfully worked for placer gold.*

Vancouver Island; gold and coal.

It is said that from the time the traveller enters British Columbia through Hell's-gate Pass till he reaches salt water, or the extreme west of Vancouver Island, he cannot get away from minerals. At Alberni and Barclay on this island miners claim to have had assays running £2 to the ton, while the placers on China Creek are said to be miniature El Dorados. Gold mining on Vancouver Island is not done on a very extensive scale, though prospects appear promising enough, but the coal mines are big enough to supply the world. Since these mines were first worked in 1836 they have yielded 11,000,000 tons, worth £6,600,000. For the last six years the output has represented £400,000 per year.

It is on the mainland, however, in the Trail district, the Slocan, East Kootenay, Boundary Creek, Harrison Lake, Cariboo and Cassiar, that the great mineral development, in gold mining chiefly, is looked for.

Kootenay.

The great gold-producing district of British Columbia is the Kootenay, which is by far the most important mining sub-division of the province. Its richest part is that known as Trail Creek on either side of the Columbia River. Its chief centre is Rossland, a town with a population of 5,000.

This district is by no means a new one. It was first discovered in 1824 by H. B. Coy voyageurs and further exploited by miners travelling into Canada from California along the Columbia river. A "rush" to the district took place in the early sixties, but the difficulties of mining the low grade surface ores in the district, the want of means of communication and gold rushes elsewhere

(**See Appendix*—"Another New Gold Field in British Columbia.")

drove (or drew) the miners away, and it was not until the last six or seven years that systematic efforts were made to open up the fields. The results have been most encouraging. In 1896 £773,000 worth of gold and silver was produced in the Kootenay and last year (1897) it is expected there will be a large increase; £2,000,000 worth of gold being the estimate, though five years ago the lode-gold production was practically *nil*.

Gold output and characteristics of the country.

British Columbia's record in gold production up to date is the very respectable total of nearly £12,000,000, while the total value of the output of mineral wealth is set down at £20,000,000. This is not brilliant compared with some of the Australasian colonies, but it must be remembered that gold mining in British Columbia has scarcely passed beyond the surface-scratching stage. As showing, however, the rapidity with which developments are taking place it is recorded that in 1896 upwards of 12,000 mineral claims were staked out, 8,000 of these being in West Kootenay. Another point to be borne in mind is that there is scarcely a square mile of the province that is not in sight of gold-bearing country.

Other minerals

Mining in British Columbia is not altogether confined to gold. Various minerals are worked, the chief of which are silver, lead, iron, cinnabar, and copper. Coal is also found in several localities, especially on Vancouver Island and in the south-east, in the vicinity of the Crow's Pass. Here 20 outcropping seams were recently discovered, having a total thickness of from 132 to 448 feet. Just outside the border on the Canadian Pacific Railway line and on Queen Charlotte Islands large seams have been found. On these islands, also, there are very rich undeveloped anthracite fields.

Classification of British Columbia ores.

The *Standard* of August 28th gives the following classification of British Columbia ores:—(*a*) Coarse-grained pyrrholite, or "iron ore," containing very little gold; (*b*) ore containing iron pyrites, arseno-pyrites, and other compounds, in which the silver value exceeds the gold; (*c*) typical ore of the principal mining camps, divided into two classes. the first of which yields on an

average 2·6 oz. of gold, 1·8 oz. of silver, and 2·5 per cent. of copper to the ton, and the second about half the quantity of each. According to the mining regulations, a Crown grant is given on completion of £100 worth of work, while a claim held as a location requires that its owners each have a free miner's license and do £20 worth of work per annum, or pay £20 into the provincial treasury. Wages run from 12s. to 20s. a day for shifts of eight to ten hours.

Government mining grants.

Mining wages in British Columbia.

Dr. Dawson's opinion of British Columbia prospects.

Dr. Dawson, the recognised and greatest authority on mineralogy in Canada, states—"Everything that has been ascertained of the geological character of the province, as a whole, tends to the belief that, as soon as means of travel and transport shall be extended to what are still the most inaccessible districts, they also will be discovered to be equally rich in minerals, particularly in precious metals—gold and silver.

Ontario.

(*See, also, Appendix.*)

This province bears the reputation of being the most beautiful and healthful in America, if not in the world. It may also truthfully be said to have the most fertile soil, the richest area of mineral country, and the most liberal land laws.

Its immense area of 222,000 square miles only contains a population 2,114,000, thus providing wide scope for the industrious immigrant. A word or two for the intending emigrant bent on agriculture.

Free Grant Lands.

Any head of a family, whether male or sole female, having children under 18 years of age, can obtain a grant of 200 acres; and a single man over 18 years of age, or a married man having no children under 18 residing with him, can obtain a grant of 100 acres.

Such a person may also purchase an additional 100 acres at 50 cents (2s. 1d.) per acre, cash.

This province is known to be extremely rich in minerals throughout its entire extent, which, however, is practically unexplored; but enough is known to prove

that the districts north of Lakes Huron and Superior are enormously rich in gold, iron, silver, copper, nickel and other minerals.

Nickel.

The nickel deposits are practically of illimitable extent and enormous value. They are situated at Sudbury, near the north shore of Lake Huron. Their importance, which was first recognised six or seven years ago, has been much enhanced by the recent decision of the Admiralty to use nickel-steel armour plating for our new ships of war, as only one other large deposit of the metal is known to exist—namely, in the French Colony of New Caledonia, where it is much less accessible than at Sudbury. The nickel occurs in association with copper, in the form of pyrrhotite, and it was for copper that the mines were originally worked. The presence of nickel was only discovered through metallurgical difficulties in treating the copper; but since 1890 the mines have been worked for both by a Copper Company, a concern consisting chiefly of American capital. The ore contains from 2 to 3 per cent. of nickel, and the deposits have been proved to be very extensive. The deepest shaft occurs in what is known as the "Copper Cliff Mine;" it has been sunk to the eleventh level—say about 700 feet—and the ore shows no sign of giving in. Other nickel companies have now been formed for extending the industry, and Canada looks forward with good reason to developing it into a leading source of wealth.

The new value of Nickel.

Gold, galena, mica, apatite, and marble in E. Ontario.

In eastern Ontario there have been considerable finds of gold, galena and mica, while the quarrying of apatite, or phosphate of lime, and marble of excellent quality, are both profitable industries.

Petroleum springs and salt wells.

In the southern district, near Lake Huron, are the famous oil springs, from which petroleum is obtained in immense quantities. In 1896 the value of the crude petroleum was valued at 1,155,646 dollars, and of natural gas 276,301 dollars. Further to the north, in the same district, are prolific salt wells, which send forth an abundant supply of brine; the salt obtained from which

forms a large item in the commerce of the place; and north of Lake Superior, in the Thunder Bay district, rich ores of silver are found; while eastward, on the Grand River, there are extensive mines of gypsum, or Plaster of Paris. There are also considerable areas of peat beds in several parts of the province.

The oldest Mining District in Ontario.

The oldest mining district is at Hastings, near the eastern border of the province. Gold was first found here in 1866, when the discovery caused considerable excitement for a time. The ore, however, proved refractory to the processes of that day, and very little gold was produced; but within the last year or two a marked revival has taken place; there has been a large expenditure on modern plant at several mines in the district, and the prospects are improving. It is at the other end of the province, however, near the Lake of the Woods and the Rainy River that most activity prevails. Here an immense and richly auriferous region has been opened up quite recently. The area is 250 miles long, and about half as broad. Gold occurs only in quartz veins, but unlike the Hastings ore, it is nearly all free milling. Dr. Coleman, the expert of the Bureau of Mines at Toronto, has just returned (August, 1897) from an official inspection of the gold fields, and reports very favourably upon them. The whole thing is still in its infancy; the oldest mine has only been worked for three years, new ones are being started almost from month to month, and further prospecting is still being carried on under a Government concession. But already the results have trebled the gold output of Ontario, and Dr. Coleman expects a large and rapid increase. "There is every prospect," he says, "that a number of mines will be producing gold in 1897, and that the total will rapidly increase. The area of the auriferous country is so enormous, and the ores as a whole so easily treated, that within a few years a very large output may be expected." In addition to these two principal gold fields at opposite ends of the province, mines are now being worked at various intervening points near the shore of Lake Superior and at Lake Wahnapitae.

The Lake of the Woods Districts.

The Lake of the Woods Gold Output has already trebled the total Output of Ontario.

Perhaps the most important of the many mining discoveries made in Ontario was that recently made on the Michipicoten River, near lake Wawa. Mr. Blue, Director of the Ontario Bureau of Mines, returned in October, 1897, from inspecting this new find, and reports the discovery of a vein of quartz then yielding 600 dollars of gold to the ton. (This new field is referred to at greater length further on, under the heading of "Mining Fields Awaiting Development.") In short, great activity prevails throughout Ontario. A new gold-field.

Northern Alberta.

This section of the North-West Territories of Canada is the only remaining portion, excepting the British Yukon, in which gold mining is carried on. For some years past, since 1863, an average of about 50,000 dollars worth of gold has been washed out of the bars and banks of the Saskatchewan River. In the early days 10 to 15 dollars per day was the average earnings of the miner, but the return now averages very little over 1½ dollars per day.

New interest has been lately aroused in the possibilities of this industry, from the fact that some Americans, who made tests in 1896, found that only about ten per cent. of the gold was saved by the hand "grizzlies" used by the miners.

For many years placer mining has been carried on along the big Saskatchewan River, chiefly on the north branch, about 200 miles north of Calgary, where fair wages are now being made every summer; the same bars being worked year after year and never becoming exhausted. Last year (1896), says the *Calgary Herald* of September 16th: "A small boom was started by discoveries of high gold values in the black sand with which the river abounds. Some 30 mining scows are now at work taking out the black sand, but for want of smelting facilities and improved methods, little is yet known of the real value of the diggings. . . . . There is gold on the bars of the south branch of the Saskatchewan, as well as on the north branch, and of the two rivers; old Gold on the Saskatchewan River.

placer miners, who have worked on both, give the south branch the preference. On some of the bars, near the Hat River, plenty of gold is being taken out. . . . . On the famous Livingstone bar there is, this summer (1897), a gold camp, where we found miners who were perfectly satisfied with their lot, one making splendid wages." . . . . .

The Yukon Country.

Part II. and Appendix to be referred to.

Under this heading the astounding gold discoveries on the Klondyke tributaries, the Stewart, Indian and other rivers tributary to the Yukon, as well as further south on the Lewes, Pelly, Hootalinqua and Big Salmon rivers, are all fully dealt with in Part II., under Sections 1, 2 and 10, and throughout the Appendix.

Mining Fields Awaiting Development.

(*See, also, Appendix—"Another New Gold Field in British Columbia."*)

As Canada's great development, which the world is looking forward to in high, and in some cases jealous, expectation, will be the direct outcome of vigorous and systematic mineral exploitation, a short review of those richly mineralised fields—many of which, though now wild forest or desolate waste, will probably be Canada's busiest and most populous centres—should prove interesting, and, perhaps, helpful to many who contemplate sharing in the operations which are to bring about this magnificent expansion of wealth and industry.

Important extracts from a notable report.

Before proceeding with the very cursory survey of the Dominion's Mining Areas, which only await man's enterprise and skill to yield up their riches, an important extract from the report of the Select Committee of the Senate (Canadian Dominion), appointed to enquire into the resources of the Great Mackenzie Basin, in 1888, might be quoted :—

Extent of auriferous country in the far N.W.

"Of the mines of this vast region little is known of that part east of the Mackenzie River and north of Great Slave Lake. Of the western effluents of the Mackenzie

enough is known to show that on the headwaters of the Peace, Liard and Peel Rivers, there are from 150,000 to 200,000 square miles which may be considered auriferous, while Canada possesses, west of the Rocky Mountains, a metalliferous area principally of good yielding rocks, 1,300 miles in length, with an average breadth of 400 to 500 miles, giving an area far greater than that of the similar mining districts of the neighbouring Republic.

Location of various mineral deposits.

"In addition to these auriferous deposits, gold has been found on the west shore of Hudson's Bay, and has been said to exist in certain portions of the barren grounds. Silver on the Upper Liard and Peace Rivers, copper upon the Coppermine River, which may be connected with on Eastern Arm of Great Bear Lake by a tramway of 40 miles, iron, graphite, ochre, brick and pottery clay, mica, gypsum, lime and sandstone, sand for glass and moulding, and asphaltum, are all known to exist; while the petroleum area is so extensive as to justify the belief that eventually it will supply the larger part of this continent, and be shipped from Churchill, or some more northern Hudson's Bay port, to England.

An immense petroleum area.

"Salt and sulphur deposits are less extensive, but the former is found in crystals, equal in purity to the best rock salt, and in highly saline springs; while the latter is found in the form of pyrites, and the fact that these petroleum and salt deposits occur mainly near the line of division between deep water navigation and that fitted for lighter craft, give them a possible great commercial value. The extensive coal and lignite deposits of the Lower Mackenzie and elsewhere, will be found to be of great value when the question of reducing its iron ores, and the transportation of the products of this vast region, have to be solved by steam sea-going or lighter river craft."

Rich fields beyond the Klondyke district.

No important mention is made in the above extracts of the regal mineral which is now creating such a sensation in the Yukon-Mackenzie country, particularly on the tributaries of the Klondyke River. But the above report was handed in years before the marvellous goldfinds of

the Bonanza and El Dorado Creeks came to light. The country between the Yukon and Mackenzie Rivers, described by both Dr. Dawson and Mr. Wm. Ogilvie, covering an area of 150,000 square miles of auriferous country, comprises the largest and most attractive—because of its fascinating possibilities as evidenced by the Klondike goldfinds—fields for the gold prospector in the Canadian Dominion—or, perhaps, in the world. This region is dealt with at some length in Sections 1 and 2, Part II.

The new gold discoveries at Michipicoton.

The Montreal correspondent of the *Standard* (London), of November 12th, 1897, writes that "The excitement caused by the gold discoveries in the Yukon country has led to reports of new Klondykes all over this Continent, most of them with very little foundation. But in the case of Michipicoton, in Ontario, official investigation has established the genuineness of the gold deposits, and given some indication of their probable extent. Mr. Archibald Blue, Director of the Bureau of Mines established by the Ontario Government, visited the new gold fields some weeks ago, but he was not able to do more than establish a registration office, to prevent disputes between the prospectors already rushing into the country. He saw enough, however, to warrant him in sending Professor Arthur B. Willmott, M.A., B.Sc., to make a further investigation of the district. Professor Willmott visited Michipicoton in September, and on his return prepared a preliminary report, which has been issued by the Ontario Government as a bulletin of the Bureau of Mines."

The Canadian Chamber of Mines, London

This report runs into many pages, and anyone proposing to visit this promising field should read the whole publication at the offices of the Canadian Chamber of Mines, 165, Fenchurch Street, London, or at the High Commissioner's Office, Westminster.

Professor Willmott's Report.

Professor Willmott sums up as follows:—"From all that I can learn from prospectors, from the number of finds of free gold, from the quantity of quartz pebbles in the lower parts of the streams, and from the great re-

semblance of the country rocks to the Lake of the Woods region, I think there is every reason to believe that the Division will well repay careful prospecting, and that in a few years gold mining will here be established on as profitable a basis as in other parts of Ontario."

Position of the Michipicoton field.

This field has an advantage over almost all other Canadian goldfields that should bring it into rapid favour —if its prospects are good enough, it is easy of access, it is situated on the North-East shore of Lake Superior, between the Lake and the Canadian Pacific Railway, and may be reached from either. The lake route is probably the easiest, and was chosen by Mr. Blue for his hurried visit. Michipicoton is about seventy-five miles directly North from Sault Ste. Marie by steamer, which lands passengers about two miles from the mouth of the river. There is an Indian reserve in the bay, so that it is not difficult to obtain canoes for the rest of the journey.

Routes to the field.

Professor Willmott, having more time at his disposal, took the inland route, travelled by the Canadian Pacific Railway to Missanabie, and thence with two Indian guides by canoe. Missanabie is forty-six miles in a straight line from Lake Superior; but the prospector follows a circuitous route, in order to take advantage of the lakes and streams. There are two routes from Missanabie, both starting in a South-Westward direction through Dog and Manitowick Lakes. Thence one follows the Michipicoton River round one-third of a circle to its outlet, a probable distance of sixty-five miles. There are on this route six portages, all well travelled, but some of them very rough. The Big Stony portage is five-sixths of a mile long, and the Long portage one mile and two-thirds. The others are short. Below the Long portage the river winds about in a gravel plain for nearly ten miles, with considerable current, making it necessary to "pole" in many places when ascending. For this reason, and because of its shortness, the route which diverges from the lower end of Manitowick is usually taken. This ascends a small stream in a South-

western direction, passes through a number of small lakes, over the height of land and down Wawa Lake to its South-West end. Thence an old Canadian Pacific construction road may be taken to Michipicoton, a distance of seven miles, or a portage of two miles to the Magpie River, and a further portage of a quarter of a mile at the mouth of this stream. At present two teams are transporting goods across the "tote-road to Wawa at exhorbitant rates. This route from Missanabie is very direct—little over fifty miles—and can be made in two days by two men travelling in a light canoe. The portages are numerous but good, except the Big Stony one. At the time of the construction of the Canadian Pacific Railway roads were built by the contractors for the purpose of getting in supplies. Though these roads are now overgrown with small brush and the bridges across the creeks have decayed, they afford to the prospector a comparatively easy entrance to the interior.

Gold-bearing country North of Lake Winnipeg.

The following extract from the Summary Report of the Geological Survey Department for 1896 describes an exploratory work by Mr. J. B. Tyrrell, of the Canadian Geological Survey made last year in the country lying along the Grass River to the North of Lake Winnipeg. Grass River is a tributary of Nelson River which flows into Hudson's Bay:—

A New Field for Mining Enterprise North of Lake Winnipeg.

Report of a Survey by J. W. TYRRELL, B.A., of the Geological Survey Department of Canada.

"On the 29th of June (1896), I left Selkirk, Manitoba, accompanied by two canoemen who had been with me through two previous seasons, and the following day reached Selkirk Island, near the mouth of the Saskatchewan River. On the morning of the 1st of July we were taken by a small fishing tug northward to Limestone Bay, and thence we proceeded by canoe along the north shore of Lake Winnipeg and through Playgreen Lake to Norway House.

Enumeration of routes surveyed.

"Here two Indians and an extra canoe were hired, and we turned westward into the country lying to the west of Nelson River, exploring Goose-gut, Pine and Wolf Rivers; returning from the latter stream to Norway House, where the two Indians were paid off.

"We then descended Nelson River to Cross Lake, where two other Indians were hired, and the descent of the Nelson River was continued to the north end of Sepaywisk Lake, whence we crossed several portages and small Lakes until we reached Burntwood River, which was ascended to Nelson House, where the Cross Lake Indians were paid off and allowed to return home. With one canoe, and the two men from Selkirk, I returned to Paint Lake, and then ascended Grass River, through Setting, Herb and Reed Lakes to its source in Cranberry Lake. From the south end of Cranberry Lake, we crossed the Cranberry Portage to Athapapuskow Lake, and thence descended Goose River, through Goose Lake, to Sturgeon River, which was descended to Cumberland on the Saskatchewan River.

"From Cumberland we ascended the Saskatchewan River to Fort à la Corne, where the canoe was stored for the winter, and we drove to Prince Albert, arriving there on the evening of the 9th of October, three months and eleven days after leaving Selkirk, having travelled in all about 1,100 miles, largely over routes previously unexplored.

Northern ledge of Palæozoic limestone

"From Lake Winnipeg and the Saskatchewan River, the horizontal Palæozoic limestone was found to extend northward to the south end of Hills Lake, on Pine River, and Herb Lake, on Grass River. Thence, the northern limit of the limestone extends westward, keeping to the south side of Grass River, and generally forming an escarpment from fifty to one hundred feet high. Goose and Athapapuskow Lakes lie in a deep bay in the face of this escarpment. West of the latter lake the northern edge of the limestone is known to extend along the southwest side of Beaver Lake, and thence onward towards Lac la Ronge south of Churchill River.

Laurentian and Huronian rocks.

"North of the limestone escarpment, the country is underlain by Archæan rocks, which have usually a gently undulating surface contour. From the Nelson River westward as far as longitude 99° 30′ they consist chiefly of gray and reddish-gray Laurentian gneisses and granites. Along the Nelson River these are cut by numerous dykes of dark-green, highly basic traps, and in the vicinity of Pipestone and Cross Lakes they are associated with an area of micaceous, hornblendic and sericitic schists, stretched schistose conglomerates and fine-grained slates of Huronian age.

"On the South side of this area, and near the edge of the gneiss, is an eruptive mass of light greenish-gray anorthosite, and a gabbro containing a large quantity of mispickel, associated with some copper-pyrites.

"On the South side of the Indian Reserve Island in Cross Lake, the hornblende-schists are cut by wide veins of coarse, white, pegmatitic granite, containing large crystals of black and white mica, some of the latter being nine inches in diameter, and very possibly indicating deposits of commercial value. On account of the evenly rounded nature of the surface, and the want of blasting materials, none of the larger crystals could be taken out, but some of the smaller fragments obtained were clean and unbroken.

"Thinly foliated green schists, probably of Huronian age, were again found on another Pipestone Lake, on the way from Cross Portage to Burntwood River.

Largest Huronian area.

"But the most extensive and interesting area of Huronian rocks was discovered on the upper part of Grass River. Beginning a short distance east of Herb Lake it extends almost continuously westward through Reed, Elbow and Cranberry Lakes, and crossing to the drainage basin of the Saskatchewan River, underlies parts of Athapapuskow and Goose Lakes.

"Seven miles east of the north end of Herb Lake, the Huronian rocks are first encountered, in a hill of massive or slightly foliated diabase largely altered to

chlorite, and a short distance further west is a ridge of dark-gray micaceous schist studded with rather large crystals of staurolite. On the east side of Herb Lake is a ridge of thinly foliated light-grey micaceous gneiss, containing a good deal of white mica, and cut by many veins of white quartz.

"On the west side of the same lake, and extending south to Wekusko Point, is an eruptive mass of coarse gabbro, approaching a diabase in texture. South of this is a considerable area of dark-green, slaty schists. On the south-west side of the lake these are cut by another large eruptive mass of a finer grained and more typical gabbro. The schists are also disturbed and altered by a large mass of red granite.

Numerous quartz veins.

"Almost everywhere the schists are cut by larger and smaller veins of white quartz. The river above Herb Lake runs for a considerable distance along the line of contact of red granite on the west, and Huronian schists and conglomerates on the east, above which it crosses an area of coarse, dark-grey gabbro, returning, near the entrance into Reed Lake, to the red granite. Near the contact are many quartz veins, associated with a good deal of iron-pyrites.

"On Reed Lake, the Huronian rocks consist chiefly of fine-grained, green slaty schists, holding much pyrites, and cut by many stringers of quartz.

Rocks of Reed and Cranberry Lakes.

"Above Reed Lake the country becomes more rugged and the hills more precipitous. The river circles round an area of basic igneous rocks, as far as Cranberry Lake, often occupying a valley along the line of contact of these rocks with the surrounding granite or gneiss. Near the contact, the rocks have been much disturbed and are cut by many veins of quartz, often containing a large quantity of pyrite.

"On Cranberry Lake the Huronian rocks are often altered to a silvery sericitic schist. The same schists extend across the water-shed to Athapapuskow Lake, and thence continue westward, perhaps beneath the undisturbed Palæozoic limestones.

Promising field for prospectors.

"This area of Huronian rocks, extending about seventy-five miles from east to west, and an unknown distance towards the north, presents a good field of exploration for the prospector for gold and other precious metals, on account of the number and variety of eruptive masses that break through it, surrounded by zones of highly disturbed and fissured rocks.

Superficial deposits.

"From Nelson River westward to longitude 100° 30′, and from the north end of Lake Winnipeg northward to beyond latitude 56°, the country is generally covered with a coating of stratified clay, varying in thickness from a few feet up to fifty, sixty, or even one hundred feet. This clay is of much the same character as that of the Red River valley, having been, like it, deposited in the bed of the old post-glacial lake that once occupied the basin of Lake Winnipeg. The rivers have, as a rule, cut down through this clay to the underlying rock, but away from the water-stretches, rock-exposures are not of very frequent occurrence. The soil is rich and fertile, and since summer frosts do not seem to be very prevalent, the country will doubtless produce in abundance all the hardier roots and cereals grown in the province of Manitoba, and cattle, sheep and horses could be successfully raised. If the country were made accessible by a railway passing through it to Hudson Bay, it would certainly support a considerable agricultural population."

Soil and climate.

Mr. Tyrrell returned to Ottawa on October 16th.

Extracts from Geological Notes on the North-Western Territories by GEORGE M. DAWSON, C.M.G., D.S., F.G.S., Director of the Geological Survey of Canada.

Slave River.

Petroleum deposits.

The district to the south of Athabasca Lake, on the Athabasca River and its tributary the Clearwater, (not included by the accompanying map), and also on Peace

River, is characterized by a great abundance of pitch and petroleum deposits and springs. These are described by Sir A. Mackenzie, Sir J. Richardson, Prof. Macoun, Dr. Bell and others (*Cf.* Reports of Progress Geological Survey, 1875-6, p. 169, 1882-84, p. 32, c c). It is interesting to observe the recurrence of such deposits at intervals along the Mackenzie valley to the Arctic Sea.

At the "Lightening Place of the Hummock" on Slave River, thirty miles below Fort Chipewyan, the limestone beds were noted by Richardson to contain mineral pitch in fissures (J. B. V., vol. 1, p. 137.)*

Salt springs.

About half-way between Athabasca and Great Slave lakes, Salt River joins the Slave River. Of this stream, Richardson writes:—"The Salt River flows in from the westward, a short way below the portages. We ascended it for twenty-two miles, including its windings, but not above half that distance in a straight line, for the purpose of visiting the salt springs from whence it derives its taste and name. Seven or eight copious saline springs issue from the base of a long even ridge about six hundred feet high, and spreading their waters over an extensive clayey plain, deposit a considerable quantity of very pure common salt in large cubical crystals. The *mother water* flowing into the Salt River gives it a very bitter taste, which it retains until near its junction with the Slave River, when the addition of some fresh water streams, renders it only slightly brackish. A few patches of greyish compact gypsum were exposed on the side of the ridge from whence the springs issue." (1st Expedition, p. 518.)

Captain Back, who accompanied Richardson, again visited these salt springs in 1833. He writes:—"There were no mounds like those seen in 1820; but just at the foot of the hill which bounds the prairie in that quarter, there were three springs, varying in diameter from four to twelve feet, and producing hillocks of salt, from fourteen to thirty inches in height. The streams were

* *Journal of a Boat Voyage through Rupert's Land and the Arctic Sea*, by Sir J. Richardson, London, 1851.

dry, but the surface of the clayey soil was covered, to the extent of a few hundred yards toward the plain, with a white crust of saline particles." (Narrative of the Arctic Land Expedition, p. 80.) Petitot states that, according to the Indians, the Caribou Mountains, between Salt River and the Peace River, contain much rock salt. (Bul. Soc. Géog., Paris, vol. x, p. 140.)

Great Slave Lake.

West end of Great Slave Lake, Bitumen

Richardson describes the west shore of this great body of water as composed of horizontal strata of limestone, forming a flat country (2nd Exp., appendix p. xxiv.) In his Journal of a Boat Voyage (vol. i, p. 152,) he writes: —"In the vicinity of the westernmost channel of the delta [of Slave River] and from thence to the efflux of the Mackenzie, the whole western shore of the lake is limestone, associated with a bituminous shale, and belonging, as well as can be ascertained from its fossils, to the Erie division of the New York system, which includes the Marcellus shales." He also refers to the limestone as being bituminous, and speaks of fossil shells of which the cavities are filled with bitumen.

Western part of Great Slave Lake.

Capt. Back's description and specimens (Arctic Land Expedition, p. 544, *et seq*), show that the north side of Great Slave Lake, from the entrance of the north arm westward, consists of Laurentian rocks. The hills are said to be rocky, low, grey and rounded, and gneiss, porphyry and granite are the prevalent materials. The large islands and promontory which occupy the centre of the eastern part of the lake are, on the contrary, "of the trap formation" and exhibit long lines of high mural precipices, sometimes distinctly columnar. Back compares these to those formerly seen by him near the Coppermine, and refers them to the same formation. Near the western end of the long island, Peth-the-nu-eh, he says the Indians obtain greenish-grey "marl" of which they make their pipes. The same point is shown by Petitot, as composed of black serpentine, which he also notes is used for the manufacture of pipes, (Bul. Soc.

Géog., Paris, vol. x., p. 143). Specimens of slaty magnesian limestone were obtained by Back from the south side of the long island. Similar limestone is associated with the series of the Coppermine River, and there is every reason to believe that the trap formation here should be referred to the same great Lower Cambrian series.

Pebbles of a jasper conglomerate, which evidently exactly resembles the jasper conglomerates of Lake Huron, were collected near the east end of the lake. The rock was, however, not seen in place. (Arctic Land Expedition, p. 547).

Mackenzie River from Great Slave Lake to Bear Lake River.

Devonian and Cretaceous rocks. Bituminous shale.

In the appendix to Franklin's Second Journey, Richardson writes:—"the only rocks seen *in situ* between Slave Lake and the Forks [mouth of the Liard] where a bituminous shale of a brownish-black colour, in thin slates, and a slate-clay of a pure yellowish-grey colour, which, as well as the bituminous shale, forms steep banks," (appendix p. xxiv). In his subsequent Journal of a Boat Voyage, (vol. i., p. 164), he describes on the same part of the river, "bituminous shale" and "greyish-green slate-clay," which weathers into a tenaceous clay, and adds:—"The whole banks of the river seem to belong to a shale formation; but from the want of induration of the beds, they have crumbled into a slope more or less steep." Though *Tentaculites fissurella* is noted as occurring in the bituminous shale, it appears probable that the general surface of the country in this vicinity is composed of Cretaceous or Laramie beds, through which the river has cut in some places to the subjacent Devonian rocks.

Liard River.

Richardson did not ascend the Liard River in any of his journeys, but learned that, "for twenty-four miles upward from its mouth, it flows through sand and shale, with limestone occasionally cropping out," while seventy-five miles up it is a high hill, named the "Noh'hanne

Butte," on the summit of which is a salt spring. From this hill, Mr. McPherson brought specimens of limestone, "similar in lithological character to those procured from the Rock by the River's Side." (J. B. V., vol. ii. p. 203). This observation may be regarded as approximately fixing the western edge of the Cretaceous and Laramie rocks in this latitude, while the limestone seen further down the Liard, may be that underlying these rocks, exposed by the river in places. In loose fragments of limestone at the mouth of the Liard, Kennicott collected fossils which, according to Meek, are referable to the Hamilton group. (Trans. Chicago Acad. Sci., vol. i., p. 69).

Neighbouring part of Rocky Mountains.

The Rocky Mountains, where approached by the Mackenzie below the mouth of the Liard, are described as consisting of a number of ridges running S.S.W., or S.W. by S., with abrupt eastern faces and longer slopes to the westward, thus corresponding with the outer ridges of the same range much farther south, and probably indicating a similar prevalent westward dip. A few specimens obtained from this part of the range are not sufficiently characteristic to be of much value, but some of them, from near the Liard River, are said to be indistinguishable from those of Limestone Point, in Great Bear Lake, noted further on. (2nd Expedition, appendix, p. xxvi). Specimens of plumbago and specular iron were also given to Richardson as derived from this part of the mountains. (p. xxv).

Graphite and iron ore.

Cretaceous and Laramie. Beds of lignite.

The valley of the Mackenzie near the mouth of Bear Lake River, is occupied by rocks referred by Richardson to the "Lignite formation," which, with little doubt, represent the series now known as the Laramie. The formation "may be characterized as consisting of wood-coal in various states, alternating with beds of pipe-clay, potter's clay, which is sometimes bituminous, and slate-clay, gravel, sand and friable sandstones, and occasionally with porcelain earth. The strata are generally horizontal, and as many as four beds of lignite are exposed in some parts." (2nd Expedition, appendix p. xvii.) The lignites were observed

to be on fire in various places, both by Sir A. Mackenzie, in 1789, by Richardson and others. Four sections seen in the banks of the river are detailed by Richardson—(1) at the mouth of Bear Lake River, (2) five miles above the mouth of the river, and (3) ten miles above the same point. (2nd Expedition, appendix pp. xix-xxi.) A detailed description of these beds and the lignites they contain is again given in the Journal of a Boat Voyage, and fossil plants obtained from the shales are figured. (vol. i., p. 186.)

Great Bear Lake and Vicinity.

Laramie Rocks. Bituminous shale, alum sulphur, and brown coal.

The greater part of the north-western and western shores of Great Bear Lake, together with the low land at the base of Great Bear Mountain, which stands on the promontory to the south, appear, according to Richardson's notes, to be formed of rocks referable to the Cretaceous or Laramie. He describes slate-clay and shale more or less bituminous, plastic and bituminous coal and earthy clay, with selenite, pyrites, poor clay-ironstone and efflorescenses of alum and sulphur. At the base of Great Bear Mountain, are bituminous slate and slate-clay, holding brown coal. The indications on Petitot's map, however, show that limestone and granite project through the newer formations in places, forming the hills in the centre of the promontory on the west shore of the lake, as well as Great Bear Mountain.

Limestone Rocks saturated with petroleum.

Other rocks described on Bear Lake River must be assigned to the Cretaceous, or possibly in part to the Laramie. At the mouth of the river, however, rocks, both of the limestone series and the Cretaceous, evidently occur, the former probably constituting a projecting ridge. A hill is described on the north bank of the river, at its mouth, composed of limestone rocks similar to those of the ridge at the rapid above referred to. Parts of the limestone are saturated with petroleum, and petroleum springs were observed by Franklin.

Salt.

On Bear Lake River, a little below the rapid, a small stream flows in from the southward, near the sources of

which the Indians procure an excellent common salt, which is deposited from springs by natural evaporation. (1st Expedition, appendix p. xiii).

Mackenzie River and vicinity below Bear Lake River.

The Ramparts to the Narrows.

In latitude 66¾, about 30 miles below The Ramparts, is a perpendicular sandstone cliff, about one hundred and sixty feet high, which presents the same castellated appearance with that above noted. The beds are horizontal, and rest on horizontal strata of limestone. (2nd Expedition, appendix p. xxxv.) Beyond this point, to "The Narrows," north of which the river divides and becomes estuarine in character, several outcrops of sandstone, marl-slate and shale were observed, all probably referable to the Cretaceous or Laramie.

Sandstones at the Narrows.

At The Narrows the sandstones are said to contain, "small, rounded, and also sharply angular grains of opaque, white, green and blue quartz with grains of lydian-stone and coal." (J. B. V., vol. i., p. 222.) These silicious materials are, in all probability, fragments of the cherty beds of the limestone series. Such material forms a great part of many of the coarser Cretaceous beds of the Rocky Mountains where they have been geologically examined south of the latitude of the Peace River.

Peel River.

The Peel River, which flows into the Mackenzie not far below The Narrows, is said to show "the shale formation in its banks," (J. B. V., vol. i, p. 222), while Isbister mentions that alum-shales occur along it to the point at which it leaves the mountains. (Quart. Journ. Geol. Soc., vol. xi., p. 511. Journ. Royal Geog. Soc., vol. xv., p. 343.)

Country between Great Slave Lake and the mouth of the Coppermine River.

The following notes, embracing the information available, for the tract of country above defined, are extracts from or abstracts of those given by Richardson in Appendix I., to the narrative of Franklin's first journey

(1819-22). The route pursued by the expedition is sufficiently indicated on the map by the chain of lakes running from Great Slave Lake to the upper part of the Coppermine River, to the north of which the river itself was followed.

Great Slave Lake to Fort Enterprise.

Of the country north of the north arm of Great Slave Lake, Richardson writes :—"The granite formation continued for a considerable distance on our route towards Fort Enterprise, but it contained more and more foreign beds as we advanced to the northward. . . . . At the mouth of Yellow Knife River, and in Lake Prosperous, mica-slate prevailed. Between Rocky and Carp Lakes, the granite contains many beds of mica-slate, and the country is tolerably well wooded" (p. 520). "At Carp Lake [lat. 63° 35'] the hills are of lower altitude, have fewer precipices, and more rounded summits; the valleys are less fertile, contain gravelly soil, and nourish fewer trees. This appears to be the commencement of the gneiss, or as it may be termed, in this latitude the *Barren Ground* formation, for it seems to exist throughout the great district to the eastward of the Coppermine River, termed the Barren Grounds by the Indians." (p. 520.)

Rocks at Fort Enterprise.

"The country about Fort Enterprise consists of short and very obtuse conical, or sometimes round-backed hills, of moderate elevations, never disposed in mountain ranges, but entirely unconnected and separated from each other by inclined valleys of moderate extent. Their summits are almost universally formed of naked smooth rock, and generally of a species of durable red granite that has been more than once mentioned as composed of well crystallized reddish felspar and grey quartz. Large, irregular, but somewhat cubical, fragments of this rock are scattered over the surface of the hills, or rest upon their very summits, by two or three angular points, as if left exposed there by the decay of the less durable material that enclosed them. . . . . The acclivities of the hills, generally speaking, consist of gneiss wrapped in a mantle form, round the granite." (p. 520.)

Following this general description (pp. 522-523), are local details respecting the vicinity of Port Enterprise; granite, micaceous and hornblendic gneiss, greenstone, mica-slate and clay-slate, being mentioned.

The following notes embody the principal recorded observations:—

Red Rock Lake.

Eleven and a half miles on a north-westward course from the last mentioned locality (Point Lake), greenish-grey clay-slate occurs. The rocks at the west end of Point Lake were then found, for some miles, to consist of granite and gneiss, probably Laurentian. The shores of Red Rock Lake are characterized by reddish and greenish-grey clay-slates, with hills apparently of trap. One of these "bore an exact resemblance in altitude and form to Salisbury Craigs, in the neighbourhood of Edinburgh." In latitude 66° 45′ 11″, gneiss and syenite hills were again observed on the north bank of the east-and-west reach of the river. These, I suppose from the description, to form an eastward projection from the large area of these older rocks between the Coppermine and Great Bear Lake. Beyond this point the rocks noted are as follows:—Dark red sandstone; dark purplish-red compact felspar rock, with a light reddish and greyish

Cambrian Rocks.

felspar and quartz rock, the low area characterized by these rocks is bounded to the northward, and eastward by a lofty ridge of trap rocks, which constitutes the famous Copper Mountains; reddish-grey granular foliated limestone; deep red sandstone, grey sandstone composed of grey quartz and felspar, pale red sandstone with quartz concretions, greyish-white siliceous sandstone with imbedded portions of the pale red kind; greenish felspathic trap, greenstone, flesh-red felspar and hornblende in concretions, with hornblende and amygdules of prehnite, hard wine-yellow limestone with thin layers of flint inclining to flinty-slate.

Correspondence with Lake Superior Cambrian.

The above notes, taken in conjunction with Richardson's description of the Copper Mountains, appear to show, in so far as lithological criteria may be depended on, that representatives of both the Animikee and

Keewenaw series of the Lake Superior region may occur here. The interest attaching to the Copper Mountains is so great as to justify the quotation of the paragraphs referring to them. They are as follows :—

The Copper Mountains.

"The Copper Mountains appear to form a range running S. E. and N. W. The great mass of rock in the mountains seems to consist of felspar in various conditions; sometimes in the form of felspar rock or clay-stone, sometimes coloured by hornblende, and approaching to greenstone, but more generally in the form of dark reddish-brown amygdaloid. The amygdaloidal masses contained in the amygdaloid, are either entirely pistacite, or pistacite enclosing calc-spar. Scales of native copper are very generally disseminated through the rock, through a species of trap tuff, which nearly resembles it, and also through a reddish sandstone on which it appears to rest. When the felspar assumed the appearance of a slaty clay-stone, which it did towards the base of the mountains on the banks of the river, we observed no copper in it. The rough and in general rounded and more elevated parts of the mountain, are composed of amygdaloid; but between the eminences there occur many narrow and deep valleys, which are bounded by perpendicular mural precipices of greenstone. It is in these valleys, amongst the loose soil, that the Indians search for copper. Amongst the specimens we picked up in these valleys, were plates of native ccpper; masses of pistacite containing native copper; of trap rock with associated native copper, green malachite, copper glance or variegated copper ore, and iron-shot copper green; and of greenish-grey prehnite in trap, (the trap is felspar, deeply coloured with hornblende), with disseminated native copper: the copper in some specimens was crystallized in rhomboidal dodecahedrons. We also found some large tabular fragments, evidently portions of a vein consisting of prehnite, associated with calcareous spar, and native copper. The Indians dig wherever they observe the prehnite lying on the soil, experience having taught them that the largest pieces of copper are found

Copper Disseminated through the rock.

Mode of occurrence of copper.

associated with it, We did not observe the vein in its original repository, nor does it appear that the Indians have found it, but judging from the specimens just mentioned, it most probably traverses felspathose trap. We also picked up some fragments of a greenish-grey coloured rock, apparently sandstone, with disseminated variegated copper ore and copper glance; likewise rhomboidal fragments of white calcareous spar, and some rock crystals. The Indians report that they have found copper in every part of this range, which they have examined for thirty or forty miles to the N. W., and that the Esquimaux come hither to search for that metal. We afterwards found some ice chisels in possession of the latter people, twelve or fourteen inches long, and half an inch in diameter, formed of pure copper."

Country north of the Copper Mountains.

"To the northward of the Copper Mountains, at the distance of ten miles, in a direct line, a similar range of trap hills occurs, having, however, less altitude."

Chromic iron.

A rolled piece of chromic iron was picked up on the banks of the Coppermine River by Dr. Rae, when accompanying Sir J. Richardson, in his search expedition in 1848. (J. B. V., vol. i., p. 327.)

Arctic Coast, west of the Mackenzie River.

Ranges ∥ parallel to the coast.

The Arctic coast, west of the Mackenzie, to longitude 148°, was explored by Franklin. The shore is described as low, but a short distance inland, there is a range of mountains running nearly parallel to it, comprising, from east to west, the Richardson, Buckland, British and Romanzoff chains. The low land, at least as far as the west end of the Richardson chain, is probably underlain by Cretaceous or Laramie rocks, continuous with those of the Mackenzie basin, as beds of lignite were observed at Garry Island, off the mouth of the Mackenzie, and near the Babbage River, opposite the west end of the Richardson chain. There is, however, nothing to indicate that these rocks terminate to the west at this place. (2nd Expedition, appendix, p. xxiii.)

Cretaceous or Tertiary.

Continental Shore from Mackenzie River to Boothian Peninsula.

Cretaceous and Laramie Rocks.

From Sir J. Richardson's description of the rocks along this coast, for about 270 miles east of the Mackenzie, or to the promontory of Cape Parry, they are referable, with little doubt, to the Cretaceous, or to that formation in conjunction with the superposed Laramie series.

Burnt shales.

In the bay west of Cape Bathurst, cliffs of sand and slaty-clay are noted. The extremity of Cape Bathurst is composed of cliffs of slaty-clay, which when dry, has a light bluish-grey colour. East of the Cape are beds of "alum-shale" said to resemble that of Great Bear Lake, previously referred to. At Point Trail, in this vicinity, cliffs or horizontally bedded "bituminous alum-shale" of a brown colour and interspersed with crystals of selenite and ironstone concretions, had been on fire. "The burnt clays, variously coloured, yellow, white and deep red, give it much the appearance of the rubbish of a brickfield," (2nd Expedition, appendix, pp. xli-xliii.)

The circumstances here met with, apparently, exactly reproduce those presented by similar shales of the Fort St. John group (Cretaceous) on the Smoky River, a tributary of the Peace. (Report of Progress, Geol. Survey of Canada, 1879-80, p. 57 B.)

Slate-clay is again noted in cliffs at several points further east, to the bottom of Franklin Bay, and at one place, the shaly strata were actually observed to be in a state of combustion. (2nd Exp., appendix, p. xliii.)

Richardson's remarks.

In his subsequent Journal of a Boat Voyage (vol. i., p. 270), Richardson remarks of Cape Bathurst:—"I believe that this promontory, from its northern part to the bottom of Franklin Bay, is the termination of the sandy and loamy deposit and bituminous shale, which, throughout the whole length of the Mackenzie rests on the sandstone and limestone beds so frequently noted in the preceding pages, and fragments of which may be traced among the alluvial islands in the estuary

of the Mackenzie, and in Liverpool Bay." (*Cf.* Bell on Cretaceous rocks overlying Devonian limestones on Athabasca. (Report of Progress, Geol. Survey of Canada, 1882-84, p. 14 cc.)

Extensive Cambrian area on the coast.

East of Cape Parry, for over seventy miles (Cape Lyon to point Tinney), "the rocks forming the coast line are slate-clay, limestone, greenstone, sandstone and calcareous pudding-stone," and are recognized by Richardson as belonging to a formation differing from that met with further west. (2nd Exp., appendix, p. xlv.) Naked ridges of trap rocks are mentioned in some places, and splintery reddish limestone, slate-clay and limestone interstratified, compact bluish-black limestone and other rocks are described, the dips observed being generally to the north-eastward. Though the notes are rather imperfect for this part of the coast, it is believed to be occupied by an extension of the Cambrian rocks of the Coppermine, possibly with outliers of the Silurian or Devonian limestone in some places.

In his Journal of a Boat Voyage (vol. 1., p. 283) Richardson makes the following additional important remarks respecting this portion of the seaboard:—"The quartz-rock beds acquire occasionally a pistachio-green colour, as if from the presence of epidote. A similar stone occurs at Pigeon River on the north shore of Lake Superior; and the limestones and sandstones of the latter district, with their associated trap rocks, as at Thunder Mountain [now classed as Animikie] correspond in most respects with those between Cape Parry and the Coppermine River."

Silurian or Devonian limestones.

Beyond the district above described, from Point Clifton to Cape Hearne, in Coronation Gulf, "The whole coast consists of a formation of limestone precisely similar to that which occurs at Lake Winnipeg and Parry's Peninsula." (2nd Expedition, appendix p. xlvii.) The strata are said to be nearly horizontal.

Rae River.

On Rae River, which flows into Coronation Gulf from the west near the mouth of the Coppermine, lime-

stone, bluish-grey quartz-rock and high cliffs of "basalt" are described from specimens and notes obtained by Dr. Rae, who ascended the river for about twenty miles in 1849. Among the limestone and quartz-rock, Dr. Rae discovered layers of "asparagus-stone or apatite, thin beds of soap-stone, and some nephrite or jade." In this connection Richardson further adds:—"From the similarity of the various rocks associated in this quarter, to those occurring at Pigeon River, and other parts of the north shore of Lake Superior, I am inclined to consider that the two deposits belong to the same geological era, both being more ancient than the Silurian series." (J. B. V., vol. i., p. 312.)

Apatite and jade.

Near Rae River and Richardson River, immediately to the north-west of the mouth of the Coppermine, and also on the western side of the Coppermine River, Richardson describes a series of lines of "basaltic" cliffs. "All these precipices face towards the south-south-east, or east-south-east, and radiate between west and south-south-west from a point in Coronation Gulf, at which they would meet if prolonged. (J. B. V., vol. i., p. 316.)

"Basaltic Cliffs."

A notice of the rocks near the mouth of the Copper-mine and of the Copper Mountains has already been quoted from the narrative of Franklin's first journey. Nothing material is added to this by the observations in his second journey, but notes are there given of the rocks of the Barren Grounds between the mouth of the Coppermine and Dease Bay on Great Bear Lake. Rocks of the Coppermine River series are described as extending westward to the height of land and consists chiefly of purplish grey-spotted sandstone and conglomerate. (Appendix p. l.) So far as noted, the western slope appears to be composed of "granite" and "porphyry."

Rocks between Coppermine and Great Bear Lake.

Eastward from the mouth of the Coppermine, the rocks of the coast and small islands lying off it, are described in the narrative of Franklin's first journey as similar to those of the Coppermine River, as far as Cape Barrow.

Coast east of Coppermine

Galena.

At Galena Point, fourteen miles south of Cape Barrow, on Bathurst Inlet, a narrow vein of pure galena was observed traversing gneissic rocks. (1st Expedition, p. 581.)

Boothian and Melville Peninsulas and Vicinity.

In Agnew River, on this coast, copper ore was found by Ross, and massive beds of trap are mentioned in the appendix as occurring in the Saumerez River, though this is included in the area of country generally characterized by granite.

A specimen of lead ore was found on a hill in lat. 69° 18′ 14″ on the west side of the Gulf of Boothia, (*Op. cit.*, p. 115.)

Melville Peninsula.

Rocks and minerals described by Jameson from the east coast of Melville Peninsula.

The rocks referred above, in a general way, to the Archæan, probably include areas of Huronian. Jameson mentions as among the prominent varieties of rocks derived from this region, "Granite, gneiss, mica-slate, clay-slate, chlorite-slate, primitive-trap, serpentine, limestone and porphyry." In association with these the following minerals occur:—"Zircon and beryl, also precious garnet, actinolite, tremolite, dalage, coccolite, rock crystal, calc-spar, rhomb-spar, asbestos, graphite or black lead, specular iron ore, magnetic iron ore, chromic ore or chromate of iron, titanic iron, common and magnetic iron pyrites." Some of the "transition rocks," noticed by Jameson, should probably also be classed with the Archæan, and in addition to several of the minerals above mentioned, in these were found tourmaline (schorl) and molybdenite. (Narrative of Discovery and Adventure in the Polar Seas and Regions, by Professors Leslie, Jameson, and Hugh Murray, 1830.)

West Coast of Hudson Bay.

Between this point (Cape Esquimaux) and Repulse Bay, in the course of the two journeys above referred to, granite and gneiss were observed in a number of places, and no mention is made of other rocks *in situ*, though among specimens collected, and reported on by Prof.

Tennant in the appendix, hornblende and mica-slates and chloritic and talcose slates are noted. On an island near the south shore of Ranken Inlet, Dr. Rae "picked up some specimens of copper ore, but the ore did not appear to be abundant."

Northern Continental Shore, East of Hudson Bay, with Baffin Land.

Steinhauer on Labrador.

In the Transactions of the Geological Society, vol. ii. (1814.) Rev. Mr. Steinhauer describes a number of specimens sent by the Moravian missionaries from the Labrador coast, and gives localities for labradorite, and for the soap-stone used by the Eskimo in making lamps, &c.

Mica and Graphite.

Dr. Bell specially mentions the occurrence of mica and graphite on the north shore of Hudson Strait, as being of possible economic importance.

West coast of Baffin Bay.

In a supplement to the appendix of Capt. Parry's Voyage for the Discovery of a North-west Passage in the years 1819-20 (Natural History) C. Koning describes the most characteristic rocks of the west coast of Baffin Bay as "gneiss and micaceous quartz-rock, with some ambiguous granitic compound, in which hornblende seems to enter as a subordinate ingredient (p. ccxlvii).

Remarks by Sutherland.

Dr. P. C. Sutherland, in the Quarterly Journal of the Geological Society (vol. ix., 1853, p. 299), describes the east coast of Baffin Land from Lancaster Sound to Cumberland Sound, as follows:—"On the opposite (south) shore of Lancaster Sound, at Cape Walter Bathurst, the crystalline rocks are again recognised, and from this point they occupy the whole coast southward to Cumberland Strait (Sound) and probably considerably beyond it. To this, however, I believe there is one exception, at Cape Durban, on the 67th parallel, where coal has been found by whalers; and also at Kingaite, two degrees to the south-west of Durban, where, from the appearance of the land as viewed from a distance, trap may be said to occur on both sides of the inlet

Graphite is found abundant and pure in several islands situated on the 65th parallel of latitude in Cumberland Strait, and on the west side of Davis Straight.

Rocks of Frobisher Bay.

A considerable collection of rocks and fossils, made by C. F. Hall, chiefly in Frobisher Bay and its vicinity, is described by Prof. B. K. Emerson, in Appendix III. to Hall's Narrative of a Second Arctic Expedition. The greater number of these specimens consist of ordinary Laurentian rocks, including granite, gneiss, magnetite-gneiss, hornblendic gneiss, mica-schist, etc. In association with these, in Frobisher and Field Bays, magnetite, apatite, bornite and pyrite were found, together with crystalline limestone holding cocolite. At the head of Frobisher Bay, from a hill named by Hall "Silliman's fossil mount,"* which appears to form part of a somewhat extensive development of nearly horizontal cream-coloured and sometimes magnesian limestone, a number of fossils were obtained.

Copper and iron ores.

Notes by Endlich and Haughton.

Mr. F. M. Endlich, in a list of minerals obtained in the Howgate Polar expedition (1877-78) enumerates, among others, the following from Cumberland Sound :— Muscovite, crystals and large plates; chalcopyrite, pyrrhotite, apatite, (Smithsonian Miscellaneous Collections, 1882, p. 171.)

In this appendix to M'Clintock's voyage, Professor Haughton gives the following, respecting the south shore of Pond's Bay, or inlet at the northern extremity of Baffin Land. (Lat. 72° 40'). "In this locality, a quartziferous black mica-schist underlies the Silurian limestone, and is interstratified with gneiss and garnetiferous quartz-rock, all inclined 38° W.S.W. (true)." M'Clintock states the inclination or dip of the beds as 35° to the west, in the same volume. (p. 156).

Occurrence of beds of gypsum

From the appendix to Parry's Third Voyage, we learn that in association with the limestones of the east side of Prince Regent Inlet, are subsidiary beds of

* The position of "Silliman's fossil mount" is shown on the map accompanying Hall's Life with the Esquimaux. London, 1864.

gypsum. Gypsum also occurs on the west side of the inlet in North Somerset, where it is said to occur in "beds several feet thick, extending for at least 30 miles through the country." (App. p. 147.) At the first-mentioned locality brown hæmatite was also found, apparently derived from the limestone.

Coal formation

"Coal, sandstone, clay-ironstone and brown hæmatite were found along a line stretching E.N.E. from Baring Island, through the south of Melville Island, Byam-Martin Island, and the whole of Bathurst Island. Carboniferous limestone, with characteristic fossils, was found along the north coast of Bathurst Island, and at Hillock Point, Melville Island."

Localities of fossils and rock-specimen

From a comparison of different coal exposures noted by M'Clintock, M'Clure, Austen, Belcher, and Parry, in the Parry Islands, Prof. Haughton has laid down the approximate outcrops of some of the coal beds. These he finds to agree remarkably well with the trend of the boundary of the formation drawn from totally different data. Lists of fossils and rocks from the following places, with notes, are given:—Hillock Point, Melville Island (lat. 76° N.; long. 111° 45′ W.) Bathurst Island, north coast, Cape Lady Franklin (?) (lat. 76° 40′ N.; long. 98° 45′ W.) Princess Royal Island, Prince of Wales Strait, Baring Island (lat. 72° 45′ N.; long. 117° 30′ W.) In connection with this place, it is noted that the carboniferous sandstones underlie the limestones, and that "it is highly probable that the coal beds of Melville Island are very low down in the series, and do not correspond in geological position with the coal beds of Europe" (p. 385).* Cape Hamilton, Baring Island (lat. 74° 15′ N.; long. 117° 30′ W.) Cape Dundas, Melville Island (lat. 74° 30′ N.; long. 113° 45′ W.) Cape Sir-James-Ross, Melville Island (lat. 74° 45′ N.; long. 114° 30′ W.) Cape Pro-

* Dr. Armstrong in his Narrative of the Discovery of the North-west Passage (p. 402), says of the same place, "In Princess-Royal Island, besides the characteristic Silurian limestones, there are black basalts and red jaspers, as well as red rocks, less altered by heat, but showing a passage into jasper."

vidence, Melville Island (lat. 74° 20′ N.; long. 120° 30′ W.) Winter Harbour, Melville Island (lat. 74° 35′ N.; long. 110° 45′ W.) Bridgeport Inlet, Melville Island (lat. 75° N.; long. 109° W.) Skene Bay, Melville Island (lat. 75° N.; long. 108° W.) Hooper Island, Lyddon Gulf, Melville Island (lat. 75° 5′ N.; long. 112° W.) Byam-Martin Island (lat. 75° 10′ N.; long. 104° 15′ W.) Graham-Moore Bay, Bathurst Island (lat 75° 30′ N.; long. 102° W.) Bathurst Island, Bedford Bay (lat. 75° N.; long. 95° 50′ W.) [Vesicular scoriaceous trap rocks were found here by M'Clintock, though no such rocks are mentioned elsewhere in connection with the Carboniferous.] Cornwallis Island, McDougall Bay. Silurian and Carboniferous fossils were found together at the last mentioned place. The questions raised by these are discussed by Haughton on page 389.

Coal outcrops.

Respecting the coal seams which have been discovered in the Arctic Archipelago, Prof. Haughton further remarks:—"If the different points where coal was found be laid down on a map, we have, in order, proceeding from the south-west, Cape Hamilton, Baring Island; Cape Dundas, Melville Island, south; Bridgeport Inlet and Skene Bay, Melville Island; Schomberg Point, Graham Moore Bay, Bathurst Island; a line joining all these points is the outcrop of the coal-beds of the south of Melville Island, and runs E.N.E. At all the localities above mentioned, and indeed, in every place where coal was found, it was accompanied by the greyish-yellow and yellow sandstone, already described, and by nodules of clay-ironstone, passing into brown hæmatite, sometimes nodular and sometimes pisolitic in structure" (p. 388).

Routes to the Yukon and far North-West Territories of Canada.

(*See, also, Appendix.*)

The points of view from which a new country must be viewed are (1) the value of the resources, and (2) the routes or means by which these resources can be reached and brought to market. It has been, already, conclusively shown that the North-Western Territories of Canada contain mineral resources alone of such splendid promise as should insure, now that the ball has been set rolling on the Upper Yukon, this great Dominion a swift and, perhaps, startling accession of wealth and eminence. The problem that now appears to be taxing the ingenuity of all men concerned in the development of Canada's sub-arctic region is that of the easiest and most economical routes.

The Routes to the Yukon from the West Coast.

Taking Vancouver as a starting point, it is found that there are at least nine or ten routes more or less used:—(1) St. Michael's, the Up-Yukon River route; (2) the Chilkat Pass; (3) Bound's Trail; (4) Dalton's Trail; (5) Chilkoot Pass; (6) White Pass; (7) Taku Inlet; (8) Stikeen River. There are two routes from the Coast to Telegraph Creek, the starting point on this route; one *via* the Stikeen River, the other (9) *Overland and through British Territory from the Kitimat Arm of Douglas Channel, 308 miles from British Columbia Coast to Telegraph Creek; and (10) the Fraser River—from Ashcroft (B.C.) on the Canadian Pacific Railway, 800 miles to Lake Teslin, 600 miles further to Dawson City. These are all so condemned and approved alternately by newspaper critics and returned travellers that it would require volumes of descriptive and technical detail to properly represent their respective merits or demerits. The second part of this volume briefly deals with these different routes, in the shape of extracts from various official authorities, publications and newspapers. (See Sections 10, 18 and 27, Part II.) But a few words might be said respecting the different railway schemes.

* This route has not yet been surveyed, and, therefore, cannot be described, but it is said to offer an easy grade route through All-Canadian territory, much of it good agricultural country, and skirts some of the active mining fields of B.C., and several prospective ones.

Railways from the West Coast

It is proposed to build a railway from Skagway Bay to Bennett Lake; another from the Taku Inlet to Teslin Lake; another from the Stickeen River to the last mentioned lake; and other lines are proposed from the West Coast, all terminating at some lake or river point a few miles inland and hundreds of miles from the Yukon. The question that arises respecting these proposed short railways is:—While offering a certain advantage in the matter of taking passengers and goods over the first few miles of a 600 miles' journey during the short summer season, what prospect do they present of returning dividends to shareholders? In a twelvemonth's time Dyea, Skagway, Telegraph Creek and other shipping termini will be furnished with numberless transport contractors, with whom railways will never be able to compete unless trade and passenger traffic become enormous; a prospect that certainly looks likely to be realised, but which at this stage appears too speculative a contingency upon which to build costly railways.

Objections to short costly railways.

The subject of railways viewed from a dividend-paying point of view.

The gravest objection, however, to these railways is that, for the most part, they only cover the narrow coastline between the shipping ports and the inland waterways leading to the goldfields, and are, therefore, of little service from September to June of each year, when these waterways are frozen over. (See Section 11, Part II.) Railways that are built over the mountainous coast country of this part of the American continent, and which can only command full traffic for little over four months in the year, will require to charge rather heavily during those few months if shareholders are to draw the dividends anticipated. It must also be remembered that, unlike an agricultural country, or, indeed, any other country in the world, the railway traffic, excepting in passengers, will be altogether one way; the return journeys will be almost wholly unremunerative.

Good waggon roads *versus* short railways.

Unless some means are devised of getting heavy traffic over the ice-laden lakes and rivers* it is difficult to see the wisdom of building all these short and expensive railroads until such time as sufficient encouragement is

* Section 19, Part II., refers to the use of dogs or reindeer for this purpose, but there is no doubt that mechanical science will soon overcome the difficulty. The traction engine supplies a key with which some genius will solve the problem. (*See Appendix.*)

forthcoming to build a line from the terminal point of all the coastal railways right through to the goldfields. At present good waggon roads to the navigable waterways and inland trails are all that is needed when the question is considered from the profitable investment point of view. As to building a railway 600 miles into a gold-mining country like the Yukon, before its widespread richness and permanency have been thoroughly established, and which, during the summer months, when the bulk of the carrying trade would be done, could never compete against the Mackenzie and Yukon Rivers' traffic, it is sufficient to say that no government would be so unwise as to countenance such a project.

Travellers and Traffic v. Railway Shareholders.

There is no intention of questioning the value which these coast lines will prove to traffic during the short open-waterway season, but with three or four short costly railways, all with the same object and converging towards the one point, competing against all-waterway routes and good waggon roads, and, more particularly, against each other, it is difficult to see how they are going to pay. There is no doubt that the proper course was for the Canadian Government to have had rapid surveys made of the most likely routes, before any charters were granted, and to have selected the best for a State railway, which should have been constructed at once. This would, at least, have stopped many schemes now afoot in which much disappointment and loss will be experienced.

As the case stands now, several charters have been granted for different railway projects, on some of which, it is said, preliminary operations have already begun. If possible, and not too late, it would be a wise move for the various companies, or *concessionaires*, to join forces and decide upon one railway only. The advantages of such a course are obvious.

The White Pass and Stikeen Routes.

The White Pass and the Stikeen proposed railway routes are, no doubt, the best known at present, and, of these, all information to hand at the beginning of this year (1898) gives the palm to the first-mentioned. It must be noted that railway routes are referred to, not roadways.

White Pass Route.

Skagway Bay, the starting point of the White Pass Route, has the advantage over all other seaports in this region, in having deep water, excellent shelter, and a good landing wharf for large steamers at all tides and seasons. The route, after leaving the Bay, proceeds along a flat for four or five miles, then over the coast range—the highest point of which, 2,600 feet, is reached 17 miles from Skagway. Thence it descends to Lake Bennett, 35 miles from Skagway. A survey reports that the steepest gradient for a railway by this route is only 3 feet in 100. The line continues to a point on the Hootalinqua River 90 miles from Lake Bennett, thus giving a railway of 125 miles from the sea, to an uninterrupted direct waterway to the Yukon.* From this point on the Hootalinqua it is 400 miles by the Stikeen Route *via* Teslin Lake to the sea. Of this distance nearly 150 miles must be covered by a railway from Telegraph Creek to Teslin Lake.

The Stikeen Route.

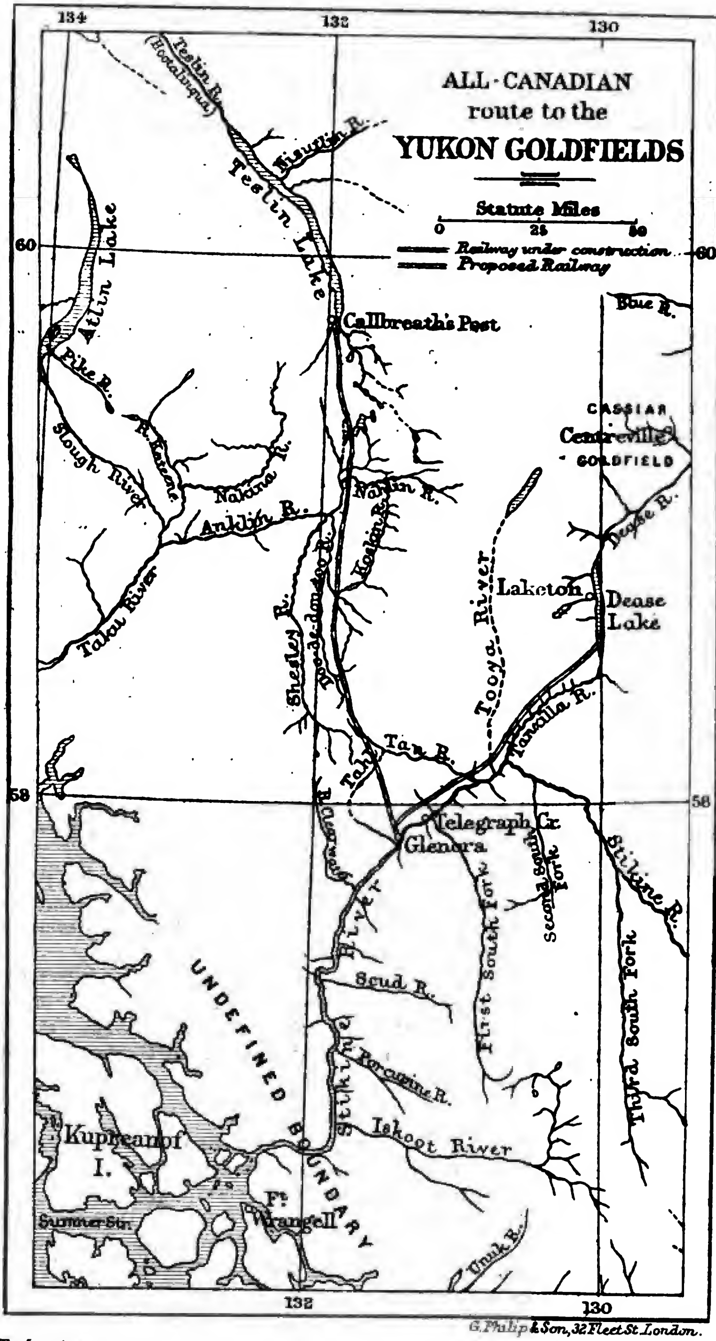
Navigation is open at all times of the year by sea to Skagway, while the Stikeen River is closed by ice for at least six months and Teslin Lake for nearly a month longer every year. But the Stikeen River labors under other disadvantages as compared with the Skagway. Even when open the river is somewhat difficult to navigate by vessels drawing not more than four feet, and lines have to be taken ashore at one particularly bad spot. Teslin Lake is closed long after the Hootalinqua River opens, and ice forms upon it sometime before it appears on the river. It is a well-known fact that ice remains on the lakes longer and forms earlier than on the rivers of this region, though on Tagish Lake and other lakes amongst the coast ranges the mountain streams keep the ice from forming and clears it off much earlier than on the lakes further inland.

These facts, certainly, give many points to the White Pass Route over that of the Stikeen.

Ugly features on the St. Michael's, Chilkoot and Taku River Routes.

There are three other routes, of which a great deal has been said that is misleading. The following summing-up of Mr. Ogilvie's latest utterances (Lecture at

(* There is an alternative scheme of extending this line to Fort Selkirk instead of the Hootalinqua River.)


ALL-CANADIAN
route to the
YUKON GOLDFIELDS
Statute Miles
0
25
50
Railway under construction
Proposed Railway
134
132
130
60
58
Teslin R. (Hootalinqua)
Teslin Lake
Nisutlin R.
Atlin Lake
Pike R.
Callbreath's Post
Slough River
Nakina R.
Nahlin R.
Anklin R.
Taku River
Sheslay R.
Tooya River
Laketon
Dease Lake
Dease R.
Blue R.
CASSIAR
Centreville
GOLDFIELD
Tanzilla R.
Tahl R.
Tan R.
Telegraph Cr.
Glenora
Clearwater R.
Stikine R.
Scud R.
First South Fork
Second South Fork
Third South Fork
Porcupine R.
Iskoot River
UNDEFINED BOUNDARY
Kupreanof I.
Sumner Str.
Ft. Wrangell
Unuk R.
Stikine R.
G. Philip & Son, 32 Fleet St. London.

To face p. 42.

NEW CANADIAN ROUTE TO KLONDIKE.

From "The Times."

TORONTO, JAN. 26, 1898.

I have just obtained in advance from an absolutely trustworthy source the following information, which I believe to be of great interest, so I transmit it at once:—

Mr. William **Mackenzie**, of the firm of Mackenzie, Mann, and Company of this city, one of the greatest railway contractors in the country, last night signed a contract with the Dominion Government which may be regarded as of the greatest importance to Canada and will be heard of with great interest in all parts of the world.

It appears that since the Yukon discoveries the Government have been resolved to establish an all-Canadian route directly to the gold mines, and have made explorations to this end. A location has now been fixed and particulars will be made public to-morrow. The contract entered into is for the immediate construction of 150 miles of railway which will at once revolutionize the whole question of the approach to Klondike. An unexpectedly favourable route has been found. The water approach will be by the Stickeen river, which affords good navigation to Glenora, 140 miles from the mouth.

The contract is for the construction from this point of a line of railway 150 miles in length to Teslin Lake, from which there is continuous good navigation for river steamboats to Klondike and all points in the Yukon district. The contractors have undertaken to have the line completed by next September, six weeks before the close of the river navigation.

It is believed that they are perfectly able to carry out this engagement, having complete organization for such work. Outfits are being shipped this week to commence operations. The Stickeen river passes through Alaskan territory for a distance of 30 or 40 miles. It is one of the treaty rivers, the free navigation of which is guaranteed for British commerce. Arrangements, however, will be made so that, if necessary, a continuation of the line from Glenora can be made southward over entirely Canadian ground by building 150 miles of additional railway to a Canadian ocean port. It is estimated that passengers by this route will reach Klondike from the ocean in five or six days.

The Government has secured the completion of this great undertaking without any cost in money to the country. The company receive a large grant of mineral lands by way of assistance to the enterprise, the Government reserving alternate blocks from the lands selected.

There will undoubtedly be a feeling of great satisfaction throughout Canada at the creation of this comparatively easy and independent line of communication, and the inception of the enterprise will profoundly affect all other arrangements for transportation and all questions touching the development of the vast gold territory of the Yukon.

(FROM OUR CORRESPONDENT.)

OTTAWA, JAN. 26, 1898

The Government have made arrangements by which a well-known Canadian firm of railway contractors will build a railway from Telegraph Creek, on the Stickeen river, to Teslin Lake, to connect with navigation to Dawson City and the Yukon goldfields. The total length of the railway will be about 190 miles. The line must be completed by September next. Its construction will render Canada wholly independent of American routes.

Victoria, B. C., November 5th, 1897) discloses some ugly features upon these routes.

The St. Michael's or Up-Yukon Route:—Only 2½ months' open navigation, and treacherous sand-bars, which are likely to limit vessels to only one trip in the season. The St. Michael's Route.

The Chilkoot Pass Route:—So rough and mountainous that, Mr. Ogilvie remarks, "it would probably be necessary to suspend the road by iron girders from the cliffs on the road to Sheep Camp, and from Sheep Camp to the head of the climb the road is yet more difficult." The Chilkoot Pass Route.

Taku River Route:—The dangers from the Great Taku glacier, and obstacles to navigation caused by enormous gravel-bars, form permanent objections to this route. The Taku River Route.

However, the object of these pages is not so much to deal with the routes from the west coast as from the point-of-view at which Europe, and more particularly this country, must regard the development of these far north-western territories of Canada, in which mining, the fisheries and furs, must ever be the only possible industries of any extent, though circumstances may bring about a wide development of the great petroleum areas which extend throughout the entire length of the great Mackenzie basin, though in some favoured localities in the South limited agriculture may be carried on and stock grazed during the short summer. The main object of these pages.

Routes and Approaches from the East and South East.

The main highway into the great auriferous territory in the far north-west, between the Yukon and Mackenzie Rivers, will ultimately be from the east, or, to be quite correct, from the south east. The exact route will be determined by such mining developments as occur throughout the North Western Territories within the next few months, but for the reasons which follow, the Mackenzie River is certainly destined to play a chief part in the opening-up of these sub-arctic regions.

Residents of Lower or South-East Canada will no doubt favor those routes of which Edmonton—a terminus Route Overland from Edmonton.

on a branch of the Canadian Pacific Railway—is the starting point. (See Map.)

A through-railway route to the Yukon from this point would pass through good agricultural country for the first few miles, but the rest of this gigantic undertaking—over 1,000 miles in length—would pass through regions absolutely unproductive for all practical purposes, excepting in the matter of furs, and such minerals as may be discovered.

A bad feature in the railway question.

A feature of this question that must be kept in view is, that railways to any goldfields in the far North-West Territories, can only pay on the outward journey; there will be little or no freight on return trips, and few passengers, so far as any appreciable addition to receipts are concerned as compared with the cost. The length and cost of this line, together with the competition of cheaper routes, must relegate the consideration of its construction to some future period when possible discoveries along its proposed route may be sufficient to warrant reconsideration. A waggon road is another matter and one will no doubt be made by the Government if the Survey Party now on the route report favourably. (See *Edmonton Routes*, No. 14. Section 21, Part II.)

Liard and Peace River routes.

There are summer routes from Edmonton to the Yukon along both the Liard and the Peace Rivers, but it is very unlikely that either will ever be popular. The dangers, length and unceasing toil—the greater portion being up a swift stream of the former, and the same drawbacks though with fewer perils but greater length of the latter, will never permit these river routes to be much favored, excepting by travellers residing in or about the districts through which these rivers flow. (See Sections 10 and 11 in Part II., for description and distances.)

The Mackenzie River route.

The route from Edmonton to the Yukon goldfields, *via* the Mackenzie River, is preferable to any other from this point because of its ease and inexpensiveness. The great attraction of this route is, that out of its entire length from Edmonton to Dawson City, 2,458 miles, 2,182 miles are down stream. There are only three

portages between the starting point and Great Slave Lake, and two or three short ones about 1,000 miles further on in McDougall's Pass, which altogether scarcely exceed a mile in length and are described by Mr. Wm. Ogilvie (1887-88 expedition)—"The Pass is wide and level, the valley being nearly a mile wide at the bottom, and very flat. It is almost treeless. Lakes in the Pass reduce the portage distance to less than half a mile." Mr. Ogilvie passed along this portion of the route in June with his canoes, thus showing that the waterways in this Arctic region are free from ice almost as early as the lakes on the Lewes River. There are Hudson Bay Posts at certain intervals, so that during the summer months this down-stream journey should be quite a pleasant trip. The only up-stream portions are on the Peel and Trout Rivers, and up the Yukon, 260 miles, to Dawson City. (See under Sections 11 and 21, Part II., for distances and particulars.)

Route from Hudson's Bay to the Yukon.

The Route of the future.

The summer route from Europe to the Yukon and the whole of the North-Western Territories, north of about Lat. 55°, will, undoubtedly, be from Hudson's Bay by way of the Great Slave Lake and Mackenzie River; and the easiest and most direct course of such a route would be *via* Chesterfield Inlet. The notes and extracts in Part II. of this work, under Sections 11 and 22 dealing with the distances, and giving the descriptive particulars and resources of the country which such a route would tap, should be read in order to understand its many advantages. Its chief value lies in the almost direct course which it provides between England and the Yukon goldfields; but it also possesses almost equal attractions in the vast extent of mineral country, Arctic whale and seal industries, freshwater fisheries, and an almost untapped fur country which it opens up to European markets, and the enterprise of European Capitalists. Perhaps its chief advantages are that throughout its entire course of over 1,000 miles from the Great Slave Lake it is navigable by river steamers; and four-fifths of this river route to the Yukon country is down stream.

Hudson's Bay.

By reference to Section 25, Part II., it will be seen, on the high authority of Dr. Robert Bell, Assistant Director of the Geological Survey of Canada, that the greater portion of Hudson's Bay and Straits is quite open to navigation throughout the whole of the year, while the same authority states—"I have a record of the principal phenomena of the seasons at Martin's Falls on the Albany River, extending through a period of fifty years, and from it I find that the river is open there on an average for six months of the year. I have also a record of dates of the opening and closing of Hayes River at York Factory, extending over 50 years, from which it appears to enjoy an average of fully six months of open water. The Nelson River is open for a longer period." There are no accounts procurable respecting Chesterfield Inlet, but it is reasonable to assume that this great arm of the Bay is open for a period not very much shorter than that of the rivers just mentioned.

Safety of Navigation inHudson's Bay.

In referring to the safety of navigation in Hudson's Bay and straits, Dr. Robert Bell states that he obtained a record from the Hudson's Bay Company which shows that "there have been almost every year during the past two centuries ships of various classes and sizes navigating the strait without loss, and it seems almost incredible that such a number of voyages could be made, extending over 374 years, without the loss of over one, or, as is claimed by some writers, two small sailing vessels!"

The navigation of Hudson's Bay will be sufficiently dealt with by quoting from the report of the 1884 Hudson's Bay Committee, which states—"No evidence has been given that goes to prove that Hudson's Strait and Bay, proper, ever freeze over, or that the ice met with in those waters is sufficient to prevent navigation at any time of the year; that Hudson's Bay and Strait appear, from all evidence taken, to be singularly free from obstruction to navigation in the shape of shoals or reefs, and, during the period of open water, from storms or fogs."

These extracts surely prove the practicability of the Mackenzie River route so far as Chesterfield Inlet—or any other port in Hudson's Bay—is concerned.

Resources of the Hudson's Bay country.

The chief consideration in the question of opening up a shipping route from Europe to Hudson's Bay is that of freight. This subject is dealt with at considerable length under Section 25, Part II., under the heading—"Hudson's Bay and its Territory." But the amazing gold discoveries on the Yukon and in the country between this great Alaskan waterway and the Mackenzie River, and the probable early development of other rich mineral areas in the far North Western Territories, present additional and urgent reasons for the opening up of this direct route from England to the Yukon-Mackenzie country.

The route after leaving Chesterfield Inlet.

The next section for consideration in this Chesterfield Inlet route is that between the Inlet and the Great Slave Lake. Mr. J. W. Tyrrell proved in his exploratory tour of '93 that deep navigable waters extend 250 miles beyond the Inlet to the head of Aberdeen Lake, and he describes himself and companions as being the first white-men who had ever been on this lake. (See Section 22, Part II.) Writing of his journey along the Doobaunt River, just before entering Aberdeen Lake, he states—"The surprising and most delightful feature of the locality was that upon the shores there was strewn an abundance of driftwood. At first sight its occurrence was unaccountable, but the mystery was readily solved, however, by finding that *we had reached the confluence of another large river flowing in from the west.* Much of the driftwood was of large size, and judging from the slightly battered condition, one would infer that it had come no very great distance, or, at any rate, through very few rapids."

A Waterway between the Inlet and Great Slave Lake.

This account leads to but one conclusion, viz., that a large unexplored river, free from any serious impediments to navigation, extends from near the mouth of Doobaunt River at Aberdeen Lake to some point directly west, or nearly so, and to some unknown distance, possibly

to branches of the Great Slave Lake. The total distance from Aberdeen Lake to the navigable branches of Great Slave Lake is somewhat about 150 miles. Branches flowing east from the Lakes and this large river undoubtedly cover the greater part, if not the whole, of this distance. Under any circumstances the country is level and easy to travel. Well-defined Indian and Esquimaux tracks from the Inlet to the Lakes have been known to exist for years.

The Great Slave Lake Section of the route.

The Great Slave Lake, about 250 miles in length, and its eastern branches are the next section of this route. The Great Lake is well known to be navigable for large river-steamers, and so also are Artillery and Golden Clinton Lake, but the channels connecting them, though well-defined on maps and apparently extensive waterways, are lacking official records.

The Mackenzie River Section.

The Mackenzie River Section comes next in this route. The following extracts from a report on an exploration in the Mackenzie and Yukon Basins in 1887, by R. G. McConnell, B.A., of the Geological Survey of Canada, supply some most valuable information concerning the navigation of the Mackenzie River, its lakes and its tributaries:—

Navigation of the Mackenzie.

"The Mackenzie River and its continuation, Slave River, are navigable from Fort Smith at the foot of the Slave River rapids to the Arctic Ocean, a distance of over 1,300 miles. A small steamer, built by the Hudson's Bay Company at Fort Smith, in the winter of 1886-8, now makes annual trips from that post down Slave River and the Mackenzie as far as the mouth of Peel River, which enters the latter at the head of its delta, and thence thirty miles up Peel River to Fort Macpherson. . . . It follows from these dates (see Section 12, Part II.) that the Mackenzie, disregarding the obstructions in low water from rapids, cannot be considered as navigable much before the 10th of June, nor later than the 20th October."

On reaching the delta at the mouth of the Mackenzie and passing through the left-hand channel for

12 miles, the Peel River is reached. Fort Macpherson is situated 14 miles up the Peel on the left bank.

Country tapped by a Hudson's Bay Route.

Before proceeding further with a description of this route, a short reference might be made to the immense area which the Mackenzie River, its lakes and tributaries, would open up were they connected with the sea by a direct route through Hudson's Bay.

The navigable area of the Mackenzie.

A vast and very rich fur country between Hudson's Bay, Athabasca Lake and the Arctic Ocean would be tapped, as well as the copper and otherwise highly mineralised country of the so-called "Barren Lands." The magnificent freshwater fisheries could also be operated upon as well as those of the Arctic Ocean by means of this great navigable waterway. Excepting a 14-mile break of rapids, the Slave River is navigable through to Lake Athabasca, in the surrounding country of which there are evidences of innumerable mineral deposits of great apparent value. The navigable Athabasca River continues further, affording command of a large extent of country of high prospective value, and, excepting a break of rapids 70 miles in extent (capable of being made navigable by improvement) Athabasca Landing is reached, whence there is a 90-mile road to Edmonton, the terminus of a branch of the Canadian Pacific Railway. The magnificent Peace River, extending from Lake Athabasca right through to the Omenica goldfields of British Columbia, and navigable throughout, excepting for three or four rapids which make portaging necessary, forms a part of this great navigable waterway system. The northern arm of Great Slave Lake, Hay River, and other smaller streams, provide further means of supplying this proposed main artery of trade.

The Peace River.

The Liard River.

About 200 miles down the Mackenzie from Great Slave Lake is the Liard River, which is navigable by steamers for quite 200 miles to the mouth of the Nelson River, which is also navigable for small steamers for at least 100 miles further on. Canoes can, and do, proceed

right on—with occasional portages—to the head waters of the Liard, where the favourable route from Edmonton to the Yukon Goldfields is met with.

Mr. R. G. McConnell, in his report, which I quote on a preceding page, states:—

The Peel River.

"Of the other tributaries of the Mackenzie, Peel River is the only one which can be considered as navigable. This is ascended annually, as stated above, by the steamer "Wrigley" as far as Fort Macpherson, and, if necessary, could be followed much further, but the exact distance is not known."

Serviceable tributaries of the Mackenzie.

But there are many short tributaries of the Mackenzie which might prove valuable arteries in connection with the fur trade, the mining industry, and trade with the Indians and Esquimaux. Of these the Nahanni, the Dahadinne, the Carcagou and the Arctic Red River are the most important on the West so far as exploration has gone, and the Willow, Blackwater, Great Bear (connecting with Great Bear Lake) and the Hare Skin rivers are the most important in the East.

A report of the highest importance upon the Mackenzie River.

The Report of the Select Committee of the Senate, appointed to inquire into the resources of the Great Mackenzie Basin in 1888, states in reference to the Mackenzie River:

> "There is a river navigation of about 2,750 miles, of which 1,390 miles are suitable for stern-wheel steamers, which with their barges may carry 300 tons; the remaining 1,360 being deep enough for light draught sea-going steamers. There is a total of about 6,500 miles of continuous lake, coast, and river navigation, broken only in two places; that the two breaks in question are upon the Great Slave and Athabasca Rivers, the first being overcome by a 20-mile waggon road from Fort Smith southwards on the Great Slave River, and the latter being a stretch of 70 miles on the Athabasca, of questionable navigation above Fort McMurray, down which flat boats or scows descend, but cannot

ascend, and which about 50 miles of waggon road would overcome, while some improvement of the rapids might make the whole river navigable; that with suitable steam crafts this river and lake navigation may be connected with Victoria and Vancouver *by way of the mouth of the Mackenzie River*, by way of the Arctic Ocean and Behring Straits and Sea, and it (the Mackenzie) is now connected on the south by 90 miles of waggon road, between Athabasca, Athabasca Landing and Edmonton, with navigable water in the Saskatchewan."

The summer route to the Yukon from the mouth of the Mackenzie.

From the Peel River the summer route generally taken to the Yukon is by way of the Trout (or Poplar) River to McDougall's Pass, where lakes reduce the portage distance to less than half-a-mile. The Pass is wide, treeless, very flat, and easily traversed.

An 8-mile creek, navigable by boats, leads to the Bell River (navigable by river steamers), which takes one to La Pierre's House, a few miles further on. From this point to the Porcupine River—also navigable by steamers—is about 30 miles. The junction of the Yukon and Porcupine is 290 miles distant. (See Notes b, Section 10, Part II.)

The mid-season route from the mouth of the Mackenzie to the Yukon.

The mid-season route from the mouth of the Mackenzie to the Yukon is the same as that just described, excepting that, instead of taking the McDougall's Pass route, a portage of between 48 and 50 miles is done. This portage is some miles longer if La Pierre's House is the objective point, but the shorter distance is from the Peel River, near Fort Macpherson, to the nearest point on the navigable Bell River, from which there is unobstructed navigation for steamers along the Porcupine to the Yukon River, or up the Porcupine River to its headwaters.

Valuable discoveries on this route.

In 1872 a Mr. James McDougall made thorough explorations of these routes—both by portage and water ways; he discovered the Pass which bears his name—and reported that it was not more than 35 miles

between good steamboat navigation on either side. He also declared that a good road could easily be made.

Mr. McDougall made a most important discovery of coal on the Trout River only a few navigable miles from the junction of Peel and Mackenzie Rivers. (See Notes B, Section 10, Part II.)

The through Peel River route.

The Peel River supplies a route that will be largely used when the object is to reach the gold-bearing reefs at the head waters of the Stewart and Macmillan Rivers. The Peel—described by the Senate Committee of 1888 as "a gold-bearing stream"—is a river that, so far as official records go, enjoys the distinction of having been explored by only one man. Mr. W. A. K. Isbister journeyed down this river in 1844, and his report is to the effect that it is 300 miles in length, and has no serious obstructions to river steamer navigation.

Mr. Ogilvie's report; the Peel River route to the Stewart River.

In his report of exploration in the Upper Yukon country of 1888, Mr. Ogilvie furnishes evidence which shows that the navigable Beaver branch of the Stewart River is only separated from the west branch of the Peel by some "low terraced sand-hills." The latest official maps contain this important west branch of the Peel, but it is absent from the earlier ones. (See Section 10, Part II.)

The Upper Porcupine route *via* the Tatonduc River.

The Upper Porcupine forms another very important route to the Yukon goldfields from the mouth of the Mackenzie River. This route, also, has been explored by one man only—Mr. Wm. Ogilvie, 1887-88. A summary of this interesting journey is contained under Note F, Section 10, Part II. of this work.

After crossing to La Pierre's House, or some other point on the Bell River, the journey is continued to the junction of the Porcupine and Bell Rivers. Instead of proceeding along the Porcupine to the Yukon River, the opposite direction is taken. The Porcupine is navigable by river steamers up to the neighbourhood of its headwaters. There are one or two other rivers by which the Yukon may be reached from the Porcupine headwaters in addition to the Tatonduc River route, but these are sufficiently referred to in notes F, Section 10, Part II. The total

distance from the Bell River to the headwaters of the Porcupine, following the river windings, is about 220 miles.

Navigation of rivers by the Mackenzie mouth route.

In his report of exploration during 1887-88 Mr. R. G. McConnell, B.A., of the Geological Survey of Canada, states:—

> "On the west side of the Rocky Mountains, the Bell, Rat, and Porcupine Rivers could easily be navigated for three or four months of the year, by small steamers, from Lapierre House down to the junction of the latter with the Yukon. Above the mouth of the Porcupine the Yukon, beyond a stiff current of from four to five miles an hour, presents no obstacle to navigation as far as Rink Rapids, a distance of over five hundred miles, and below the mouth of the Porcupine it is navigable to the sea. Stewart River, the principal tributary of the Yukon on the east in the district examined, is reported to be navigable for a distance of nearly two hundred miles above its mouth, but has not yet been ascended by the steamers plying on the Yukon."

The navigable waters of the Yukon and Mackenzie Rivers separated by only 60 miles.

> "The navigable waters of the Mackenzie are separated from those of the Yukon in Lat. 67·20 N. by a distance of about sixty miles only.* A cart trail was staked out some years ago by the Hudson's Bay Company across the interval separating these rivers with the intention of supplying the Mackenzie River district with goods by way of the Yukon, but the project fell through and the road was never built."

Official particulars establish prominent facts.

The facts established by these official reports and the extracts from authorities in Part II., are:—that unparalleled gold discoveries have been made on the Yukon River; that the richest finds are made in those rivers flowing in from the East—in the Rocky Mountain ranges; that the further up the rivers the richer the gold; that the headwaters of these rivers will be the scene of great

* Mr. Jas. MacDougall made several explorations in this neighbourhood in the seventies, and declares that the distance between good steamboat navigation on either side was only 35 miles.

mining activity; that the Peel River—after leaving the Mackenzie—offers the best means of providing a through-navigable waterway route to these headwaters, and that the Mackenzie River will be the shortest, easiest, most direct, least expensive, and most popular route from the East coast—taking an English port as the starting point.

Route *via* Behring Strait and mouth of Mackenzie.

An important summary.

The following important statement—the more significant in view of the recent gold discoveries in the Yukon-Mackenzie country—was made in the summary handed in to the Dominion Government by the Select Committee of the Senate appointed to inquire into the navigation and resources of the Great Mackenzie Basin in 1888, p. 10:—

> "That with suitable steam crafts this river (the Mackenzie) and its lake navigation may be connected with Victoria and Vancouver by way of the mouth of the Mackenzie River, the Arctic Ocean, Behring Strait and Sea." (See Sections 8 and 9, Part II.)

The Arctic Ocean Route; important points.

It is not for one moment proposed that the Arctic Ocean offers a regular means of reaching the upper Yukon goldfields that can compare or compete with other routes, but, putting the common prejudice against Arctic Seas aside, there is abundant proof available to show that this route to the mouth of the Mackenzie River is quite as safe—perhaps more so in its season—as the Yukon River. Besides, it can take deep-sea vessels, whereas the Yukon requires especially shallow draught vessels of light tonnage for its navigation. River steamers are certainly required from the mouth of the Mackenzie to the gold-bearing region, but only for 250 miles in one case (the Peel R. route), and 500 miles in the other (the down Porcupine R. route), as against about 1,800 miles by the Yukon. The distance from Victoria—taking time into consideration—is in favour of the Arctic Sea route. From Victoria to the mouth of the Mackenzie—*via* the Arctic Ocean—and along

the Peel River to the region of the headwaters of the Stewart River is about 4,450 miles, whereas from Victoria to the mouth of the Stewart River—by way of St. Michael's and the Yukon—the distance is about 4,400 miles; a difference of fifty miles in favour of the St. Michael's route, but ocean travelling is admittedly more rapid than by shifting sand-bank obstructed rivers. Besides, this ocean route gives from three to four months open seaway as against ten weeks on the Yukon. (See Section 25, p. 163, Part II.; "A prophetic statement by Dr. G. M. Dawson.")

A noteworthy extract bearing upon the navigation of the Canadian Arctic Seas.

In respect to the navigation of Canadian-Arctic Seas, and the development of their rich mineral and fishing resources, the following extract from the report of the special Committee of the Canadian Senate of 1888, p. 308, is important as confirming the opinion long held by navigators, that, taking the proper season in the year, the Arctic Coast of British North America can be navigated with ease and safety:—

> "In a memorial from Sir Roderick Murchison upon the same subject he speaks thus (p. 394): 'In respect to one of these courses, or that by Behring's Straits, along the coast of North America, we know that a single sailing vessel passed to Cambridge within 150 miles of the mouth of the Back River, and returned home unscathed, its commander having expressed his conviction that the passage in question is so constantly open that ships can navigate it without difficulty in one season.'"

An important adjunct; Arctic Sea Fisheries.

Whaling in Mackenzie Bay.

The advantage of the Arctic Ocean route to the Yukon-Mackenzie country rests in its serviceability as a means of combining the highly remunerative whale, seal and walrus fisheries in Mackenzie Bay and the Arctic coast, with the advantages it offers of reaching the goldfields and taking machinery and supplies to the head-waters of the Peel, Stewart and MacMillan rivers. (See Part II., Section 8, *re* navigation of the Arctic Ocean and the Mackenzie River, and Section 9 *re* Dr.

Taking machinery and supplies to the headwaters of the Peel, Stewart, and Macmillan Rivers.

Dawson's opinion and whaling in Mackenzie Bay; and also Section 2 *re* quartz reefs at the head waters of the rivers.)

American whalers in Mackenzie Bay.

The whaling industry (combined with the capture of the seal and walrus) is one of great value in Mackenzie Bay. This bay is said to be the best whaling ground in the world, but, curiously, it is only exploited by San Francisco whalers. They have established headquarters at Herchel Island, about 90 miles from the mouth of the Mackenzie River, as, being subjects of the United States, they are debarred from coming within the three mile shore limit. Even as it is they are said to be acting contrary to International Law. Inspector Constantine reports that there were 1,200 men (all United States Americans) on this island in the 1895 season, and the Hon. John Schultz reports that their profits are enormous. (See Section 9, Part II.)

A splendid opening for British enterprise.

Why British whalers, with the greater advantages they could command by being British subjects, do not establish themselves in this industry in these prolific waters, is a question often asked by well-informed authorities in Canada (see Section 9, Part II.), but invariably answered with the reply that the industry could only be conducted from Victoria or Vancouver, from which places, however, no whaling is carried on.

This is a reason in which there is a notable want of spirit—because of the fear of American competition, and perception—because of the splendid opportunity that is lost.

The future importance of Mackenzie Bay.

In view of the great mining development that is promised in this region, there is little doubt that the Mackenzie Bay fishing industry will shortly assume considerable importance, as whaling vessels now going to those fishing grounds comparatively empty will fill up with supplies for the goldfields, and to supply those miners who take the Mackenzie and Peel Rivers' route to the fields. Besides, as before mentioned, heavy machinery and supplies can be easily taken by

this deep sea route to the quartz reefs at the rivers' headwaters.

The Archangel of North America.

Considerable scepticism is felt in respect to the prospective value of the mouth of the Mackenzie as a commercial seaport. Dr. Dawson, however, dispels any doubt in this direction by proving that the circumstances of Mackenzie Bay and the White Sea are almost parallel, and that what is being done so successfully in Sub-Arctic Russia should be done equally well in Sub-Arctic America. (See section 24, Part II.)

Comparison with Arctic seaports in Northern Europe and Asia.

Other examples are shewn in the prosperity of many cities quite as far north as the mouth of the Mackenzie. Besides, northern Asia affords even more telling comparisons, numbers of British vessels going many degrees further north on ordinary shipping business and with nothing like the promising prospects held out in this easily reached bay, into which the mighty and far reaching Mackenzie discharges its great volume of tepid waters.

The Dominion's future.

The future of British North America is a fascinating problem to speculate upon, the only danger being that the more one studies the indications of its enormous resources, the more boundless become its possibilities, until one passes into a state of bewilderment at the apparent extravagance of the prospect. Its agricultural, lumber, and fishery resources are rich and promising indeed, but when its future mineral development is added the vista widens out beyond all human calculation.

THE

ROUTES AND MINERAL RESOURCES

OF

N. W. CANADA.

PART II.—AUTHORITIES.

Wherever the word "evidence" is used in a headline, it must be understood that the matter immediately following is an extract from the Report of the Select Committee of the Senate appointed to enquire into the Resources of the Mackenzie Basin for the Government of the Dominion of Canada, 1888.

Section 1. Untold wealth of Alluvial Gold in the Country.

General Summary of the 1888 Senate Committee.

The rich mineral resources of this great area.

Of the mines of this vast region little is known of that part east of the Mackenzie River and north of the Great Slave Lake. Of the western affluents of the Mackenzie enough is known to show that on the head-waters of the Peace, Liard and Peel Rivers there are from 150,000 to 200,000 square miles which may be considered auriferous, while Canada possesses west of the Rocky Mountains a metalliferous area, principally of gold-bearing rocks, 1,300 miles in length with an average breadth of from 400 to 500 miles, giving an area far greater than that of the similar mining districts of the neighbouring Republic.

The Yukon Goldfields.

The following account of the Yukon Goldfields district is embodied in a report issued from the office of the High Commissioner of Canada, August, 1897.

Boundaries and Area of the Yukon District.

The Yukon district is a vast and, as yet, little known tract of country which forms the extreme north-westerly portion of the North-West Territories of Canada. It is bounded to the south by the northern line of British Columbia (lat. 60 deg.), to the west by the eastern line of the United States Territory of Alaska, to the east by the Rocky Mountain ranges and the 136th meridian, and to the north by the Arctic Ocean. The district has an area of 192,000 square miles, or about the size of France, and of this area 150,768 square miles are included in the watershed of the Yukon River.

Character of the Country.

The region as a whole is naturally mountainous in character, but it comprises as well a large area of merely hilly or gently undulating country, besides many wide and flat-bottomed valleys. It is more mountainous in the south-east, and subsides generally and uniformly to the north-westward, the mountains becoming more isolated and separated by broader tracks of low land. The average base level may be stated at a little over 2,000 feet.

The Yukon or Pelly River.

The Yukon or Pelly River provides the main drainage of the region. This river passes from Canadian into American territory at a point in its course 1,600 miles from the sea. The 200 miles of its course in Canada receives the waters of all the most important of its tributaries—the Stewart, Macmillan, Upper Pelly, Lewes, White River, etc.—each with an extensive subsidiary river system, which, spreading out like a fan towards the north-east, east, and south-east, facilitate access into the interior.

Dr. Dawson's Expedition.

In 1887 an expedition was despatched by the Canadian Government to the Yukon country, under the personal charge of Dr. G. M. Dawson, now Director of the Geological Survey of the Dominion, and that gentle-

man's exhaustive report, published among the proceedings of the survey in 1888, contains the most authentic information at present available on the geology, topography, and general characteristics of the district.

The immediate necessity for the exploring and surveying work undertaken by the expedition arose from the fact that somewhat important developments of placer gold-mining had been attracting a yearly increasing number of miners and prospectors into a portion of the region in question; and the work decided on included also the preliminary determination of the point at which the Yukon or Pelly River crossed the 141st meridian, which line constitutes the boundary between the Canadian North-West Territories and Alaska.

The first Gold-prospectors.

So far as is known, it was as late as the year 1878 that the first gold-prospector entered the country, and from that time onwards small parties of miners and prospectors regularly have made their way thither. The route generally taken is *viâ* the head of Lynn Canal by the Chilkoot Pass and the Lewes River, whose upper waters lie within thirty miles of tide water. While gold has been found from the outset in the bars of the Lewes River and its affluents, it was generally in unremunerative quantities for the conditions under which mining could be conducted in that remote and difficult region. In 1881, however, paying placers were found along the Big Salmon River. In 1882 the Upper Pelly River was prospected, and in 1884 mining operations were successfully carried on on that river and the Tes-lin-too, a southern tributary of the Lewes. In 1885 mining was begun along the Stewart River, which soon attracted the greater part of the mining population. Cassiar Bar, on the Lewes, with rich deposits, was discovered early in 1886; while in the autumn of that year came the sensational discovery of "course gold" on Forty-mile Creek, still further down the main river than the Stewart. The announcement of this fact drew off nearly the entire mining population to that place in 1887.

Gold-bearing Rivers.

Of the results of the gold discoveries to that date, Dr. Dawson writes as follows in his report :—

Dr. Dawson's Report.

"Taking a general view of the gold discoveries so far as made in the Upper Yukon country, we find that, though some small bars have been worked on the upper part of the Lewes, and 'prospects' have been obtained even in the streams flowing into Bennett Lake, paying bars have been found on this river only below the mouth of the Tes-lin-too. The best of these are within a distance of about 70 miles below this confluence, and the richest so far has been Cassiar Bar. This is reported to have yielded, in some cases, at the rate of 30 dollars a day to the hand, and gold to the value of many thousand dollars has been obtained from it, chiefly in 1886. In 1887 only three or four men worked here. All along the Lewes below the Tes-lin-too many bars occur which, according to the reports of prospectors, yield as much as 10 dollars a day; and the same is true of the Tes-lin-too itself, both below and above Tes-lin Lake. Bars of this kind are, however, considered scarcely remunerative at present.

Gold yields on the Lewes and Tes-lin-too Rivers.

Gold on the Big Salmon and Upper Pelly Rivers.

"Gold has also been found for a long distance up the Big Salmon River, and on the Upper Pelly as far as it has been prospected. The Tes-lin-too, Big Salmon River, and Pelly have each already afforded some good paying ground, but in consequence of the rush to Forty-Mile Creek only about 13 miners remained in 1887 on the first-named river, four on the second, and two on the Pelly. On the Stewart River, as much as 100 dollars a day to the hand was obtained in 1885 and 1886, and probably over 100,000 dollars worth of gold has already been obtained along this stream. It has been prospected for a distance of 100 to 200 miles from its mouth (according to varying statements), and the gold found furthest up is said to be somewhat 'coarser' than that of the lower part.

Yield on the Stewart River.

Forty-Mile Creek.

"Forty-Mile Creek is reported to be a river of some size, but more rapid than most of those in the district.

It has, according to miners, been prospected for about 100 miles from its mouth, gold being found almost everywhere along it as well as in tributary gulches. The gold varies much in character, but is quite often coarse and nuggety, and very large amounts have been taken out in favourable places by individual miners. Few of the men mining here in 1887 were content with ground yielding less than 14 dollars a day, and several had taken out nearly 100 dollars a day for a short time. The amount obtained from this stream in 1887 is reckoned by some as high as 120,000 dollars, but I believe it would be safe to put the entire output of the Upper Yukon region for the year at a minimum of 75,000 dollars, of which the greatest part was derived from this stream.

"The number of miners in the whole Upper Yukon country in 1887 may be stated at about 250; of these, 200 were on Forty-Mile Creek, and it was estimated that at least 100 would winter on the creek to be ready for work in the spring.

"Forty-Mile Creek is what the miners term 'a bed-rock creek'—*i. e.*, one in which there is no great depth of drift or detrital deposits below the level of the actual stream. It is so far the only locality which has been found to yield 'coarse gold,' but from the extremely wide distribution of 'fine gold' it may safely be predicted that many more like it remain to be discovered.

Class of Mining done hitherto.

"Mining can scarcely be said to have begun in the region more than five years ago, and the extent of country over which gold has been found in greater or less quantity is already very great. Most of the prospecting has been confined to the banks and bars of the larger rivers, and it is only when their innumerable tributary streams begin to be closely searched, that 'gulch diggings' like those of Dease, McDame, and other streams in the Cassiar district, and possibly even on a par with Williams and Lightning Creeks in Cariboo, will be found and worked. The general result so far has been to prove that six large and long rivers—the Lewes, Tes-lin-too, Big Salmon, Pelly, Stewart and White—yield 'fine gold' along hundreds of miles

of their lower courses. With the exception of the Lewes, no part of the head waters of any of these have yet been prospected or even reached by the miners, and scarcely any of their innumerable tributaries have been examined. The developments made up to this time are sufficient to show that when means of access are improved, important bar-mining will take place along all these main-rivers, and there is every reason to anticipate that the result of the examination in detail of the smaller streams will be the discovery of much richer auriferous alluviums. When these have been found and worked, quartz-mining will doubtless follow, and the prospects for the utilisation of this great mining field in the near future appear to me to be very promising."

Dr. Dawson's opinion of future prospects.

(*For distances and further particulars of the streams and resources of this territory, see Index.*)

The Klondyke River and District.

The name "Klondyke."

William Ogilvie, of the Department of the interior, in his report to the Surveyor-General of Canada, dated November 6th, 1896, says the name Klondak, Klondyke, or Clondyke, as it is variously spelled, is "a mispronunciation of the Indian word or words Thron-dak or Duick," which means plenty of fish, from the fact that it is a famous salmon stream. It is marked Tondack on old maps. It joins the Yukon from the east a few miles above the site of Fort Reliance.

The first discovery of Gold on the Klondyke.

Concerning the discovery of gold on this stream he says:—"The discovery, I believe, was due to the reports of Indians. A white man named G. W. Carmach, who worked with me in 1887, was the first to take advantage of the rumors and locate a claim on the first branch, which was named by the miners Bonanza Creek. Carmach located here late in August, but had to cut some logs for the mill here to get a few pounds of provisions to enable him to begin work on his claim, the fishing at Klondak having totally failed him. He returned with

a few weeks' provisions for himself, his wife and brother-in-law (Indians), and another Indian, in the last days of August and immediately set about working his claim. As he was very short of appliances he could only put together a rather defective apparatus to wash the gravel with. The gravel itself he had to carry in a box on his back from 30 to 100 feet. Notwithstanding this the three men working very irregularly washed out 1,200 dollars in eight days, and Carmach asserts with reason that had he had proper facilities it could have been done in two days, besides having several hundred dollars more gold, which was lost on the tailings through defective apparatus. On the same creek two men rocked out 75 dollars in about two hours, and it is asserted that two men in the same creek took out 4,008 dollars in two days with only two lengths of sluice boxes. This last is doubted, but Mr. Leduc assures me he weighed that much gold for them, but is not positive where they got it. They were newcomers and had not done much in the country, so the probabilities are they got it on Bonanza creek. A branch of Bonanza, named Eldorado, has prospected magnificently, and another branch named Tilley Creek has prospected well; in all there are some four or five branches to Bonanza Creek which have given good prospects. There are about 170 claims staked on the main creek and the branches are good for about as many more, aggregating say 350 claims which will require over 1,000 men to work properly.

Splendid returns.

The Creeks of the Klondyke prospected magnificently.

A few miles further up Bear Creek enters Klondak, and it has been prospected and located on. Compared with Bonanza it is small and will not afford more than 20 or 30 claims, it is said.

Klondyke tributaries yielding wonderful returns.

About 12 miles above the mouth Gold Bottom Creek joins Klondak, and on it and a branch named Hunker Creek after the discovery very rich ground has been found. One man showed me 22·75 dollars he took out in a few hours on Hunker Creek with a gold pan prospecting his claim on the surface, taking out a panful here and there as fancy suggested. On Gold Bottom

Creek and branches there will probably be two or three hundred claims. The Indians have reported another creek much farther up, which they call Too Much Gold Creek, on which the gold is so plentiful that, as the miners say in joke, "You have to mix gravel with it to sluice it." Up to date nothing definite has been heard from this creek.

Scope on the Klondyke gold fields.

From all this we may, I think, infer that we have here a district that will give 1,000 claims of 500 feet in length each. Now, 1,000 such claims will require at least 8,000 men to work them properly, and as wages for working in the mines are from 8 to 10 dollars per day, without board, we have every reason to assume that this part of our territory will in a year or two contain 10,000 souls at least, for the news has gone out to the coast, and an unprecedented influx is expected next spring. And this

Indian Creek.

is not all, for a large creek called Indian Creek joins the Yukon about midway between Klondak and Stewart river, and all along this creek good pay has been found. All that has stood in the way of working it heretofore has been the scarcity of provisions and the difficulty of getting them up there even when here. Indian Creek is quite a large stream, and it is probable it will yield 500 or 600 claims. Farther south yet lies the head of several

The Stewart River.

branches of Stewart River, on which some prospecting has been done this summer, and good indications found, but the want of provisions prevented development.

Good quartz on Klondyke tributaries.

Good quartz has been found in place just across the line on Davis Creek (see my map of the 141st . . .), but of what extent is unknown, as it is in the bed of the creek and covered with gravel. Good quartz is also reported on the hills around Bonanza Creek; but of this I will be able to speak more fully after my proposed survey. It is pretty certain, from information I have got from prospectors, that all, or nearly all, of the northerly branch of White River is on our side of the line, and copper is found on it, but more abundantly on the southerly branch of which a great deal of it is in our

territory also; so it is probable we have that metal too. I have seen here several lumps of native copper brought by the natives from White River, but just from what part is uncertain. I have also seen a specimen of Silver ore said to have been picked up in a creek flowing into Bennett Lake, about 14 miles down it on the east side."

Copper and Silver.

(*For distances and further particulars, see Index*).

Bishop CLUT'S Evidence.

In the Peace and Liard rivers certainly there is gold in large quantities. It is found in the sand bars, and I fancy that mines will be found in tho Rocky Mountains, and that the gold is carried from that part the same as in British Columbia. . . . I should imagine there are considerable veins of gold in the Rocky Mountains.

Gold in the rivers rising in the Rockies between the Yukon and Mackenzie Rivers.

Extracts from the Report of Mr. WILLIAM OGILVIE, Dominion Land Surveyor.

I have heard the amount of gold taken from the Stewart River in 1885 and 1886 estimated at various amounts. . . . Many agree that 30 dollars (£6 5s.) per day, per man, was common on many of the bars of the river, and instances of as high as 100 dollars per day having been earned were spoken of.

Mining on the Stewart River.

I cannot here enter into the reasons for it, but I unhesitatingly make the assertion that this corner of our territory from the coast strip down and from the 141st meridian *eastward* will be found to be a fairly rich and very extensive mining region.

A very extensive mining region from the 141st meridian *eastward*.

Up to date of mailing, November 22nd, (1896,) very rich prospects have been found on the few claims prospected on: from one dollar to the pan of dirt up to 12 dollars are reported and no bed-rock found yet. This means from 1,000 to 12,000 dollars per day per man sluicing.

From 1,000 to 12,000 dollars per man per day.

CUDAHY, 9th December, 1896.

Marvellously rich yields.

Since my last the prospects on Bonanza Creek, a tributary of the Klondyke, and tributaries are increasing in richness and extent until now it is certain that millions will be taken out of the district in the next few years.

On some of the claims prospected the pay dirt is of great extent and very rich. One man told me yesterday that he washed out a single pan of dirt on one of his claims and found £3 worth of gold in it. Of course, this may be an exceptionally rich pan, but 5 to 7 dollars per pan is the average on that claim it is reported, with 5 feet of pay dirt and the width yet undetermined, but it is known to be 30 feet, even at that; figure the result at 9 to 10 pans to the cubic foot and 500 feet long: nearly 4,000,000 dollars at 5 dollars per pan, one-fourth of this would be enormous.

The richest mining area ever found:—official report.

CUDAHY, 11th January, 1897.

Some of the claims are so rich that every night a few pans of dirt suffices to pay the hired help when there is any; as high as 204 dollars has been reported to a single pan but this is not generally credited. Claim owners are now very reticent about what they get, so you can hardly credit anything you hear; but one thing is certain—we have one of the richest mining areas ever found with a fair prospect that we have not yet discovered its limits.

Extracts from the Report by R. G. McCONNELL, B.A., of the Geological Survey Department of Canada, 1888-89.

Banks of Mackenzie Delta and the Peel River are composed of alluvial sands and clays.

The "Daily Chronicle," 5th August, 1897, states:—

Every claim pegged out a prize; no blanks.

Of all the 800 claims staked out on Bonanza Creek and Eldorado Creek not one has proved a blank. Equally rich finds were made on June 6th to 10th on Dominion Creek. Not less than 300 claims have been staked out on Indian Creek, and the surface indications are that those are as rich as any of the others. The largest nugget found was picked up by B. Hudson on Claim 6, on the Bonanza, and was worth 257 dollars. Next in size was one found by J. Clements on Indian Creek, worth 231 dollars. Bigger pockets have been struck in other regions, but nowhere has so general a find been made.

Fortunes taken out in one season.

"In all, about seventy-five lucky miners have reached St. Michael's. Some brought but a portion of their clean-up, preferring to invest other portions in claims they know to be rich. Among the most lucky are J. J. Clements, of Los Angeles, who cleaned up about 175,000 dollars. The last four pans Clements took out were worth 2,000 dollars, and one went 775 dollars. He brought out 50,000 dollars, and invested the rest. Professor Lippy, of Seattle, brought out about 50,000 dollars, and he has 150,000 dollars in sight, and claims his mine is worth 500,000 dollars, or more. W. Stanley, of Seattle, also cleaned up 112,000 dollars; C. Berry, 110,000 dollars; H. Anderson, 55,000 dollars; F. Keller, 50,000 dollars; T. J. Kelly, 33,000 dollars; W. Sloan, of Nanaimo, 85,500 dollars; and at least thirty more who did not talk, but stood guard over their treasure in the state room. Then there are about twenty more men bringing from 5,000 dollars to 20,000 dollars. All this gold is the clean up on last winter's work. It must come out *viâ* St. Michael's, and the bulk of the supplies must go in that way. The two great transportation companies pushing in supplies, are the North American Trading and Transportation, and the Alaska Commercial Company."

The following appeared in the "Daily Telegraph" of August 12th, 1897:—

£200 worth of gold washed out of one diggers' hand-pan.

"In conversation with a representative of Reuter's Agency, Mr. Harry de Windt communicated his impressions regarding the goldfields at Klondyke.

"He said: 'There is no doubt that extraordinary rich finds have been made at Klondyke, although it is not possible to vouch for the accuracy of a great many of the accounts. Mr. Ogilvie, the Dominion Government Surveyor in Alaska, with whom I stayed just a year ago to-day, has since written home saying, that he had, with his own hands, washed 560 dollars worth of gold out of one pan. Another case for which I can vouch is that of a fireman on board one of the Yukon River steamers, who last year was earning 8 dollars a month, and has just returned here with 170,000 dollars worth of nuggets and dust.'"

In the "Financial Guide" of August 9th, 1897, appeared the following:—

No ill-founded "rush" . . the country "reeks with gold."

"Klondike practically defies competition. In the course of the present century there have been several 'rushes' to so-called mining camps, but the present excitement has a solid foundation. Klondike is not a 'pocket' district. It is gold bearing throughout, and its water-courses, as we are told in an American despatch, 'literally reek of gold.' One can best judge of the importance of the wonderful finds at Klondike by the value of the precious metal won there in a few months."

"Daily Telegraph," 22nd July, 1897.

"A telegram from New York, dated July 23rd says, that there were on that date still 4,000,000 dollars of gold dust to come down from St. Michael's. The

special correspondent of the *Daily Telegraph* wired on July 22nd :—

"'The Dominion Government at Ottawa, is using every effort to complete the organisation of the district in which the goldfields recently discovered along the Klondyke and other creeks are situated. This action has been taken in view of the fact that the Government is in possession of information which corroborates the first accounts given of the richness of these placer diggings.'"

The vast richness of the country officially corroborated.

"Under date July 25th, Reuter's special correspondent at Victoria (British Columbia) wires :—

"Never in the history of the Pacific Coast has there been such excitement as is at present being manifested in connection with the recent gold discoveries on the Klondike placers, which undoubtedly appear to be the richest ever found. Their actual extent is unknown, but the total area of the auriferous region in Canada, in which they are situated, extends to nearly a quarter of a million square miles. Dr. Dawson, of the Geological Survey, classed this whole area alike, and gold-bearing gravels have been found in the bed of every stream."

250,000 square miles declared by Dr. Dawson to be equally rich in gold.

"Accounts received from the mines tell of fabulous richness. No one knows how much gold has been taken out. Miners have brought out all they could carry, and others have remained behind because they have found more gold than they could bring away.

All accounts agree as to the fabulous richness of the country.

"One man speaks of seeing in one cabin four five-gallon cans full of gold dust. Another tells of a bank out of which nuggets stuck like pebbles.

"Dougall McArthur, a miner, who has returned with a fortune, stated yesterday, that the reports of fortunes being made in a day are not exaggerated. He declares that there is no danger of the country becoming overcrowded, as there are mines enough for all."

Reports not exaggerated.

The richest Goldfield in the world. Over £200 to the pan not uncommon

"Mr. Berry (Mr. Clarence Berry, of Fresno, California, who, together with his wife, went to Klondike three years ago), says, 'Klondike is the richest goldfield in the world.' Some of the pay streaks are nearly all gold. One thousand dollars to the pan is not uncommon, and over 100 ounces have been taken out in a single pan. It is not unusual, Mr. Barry says, to see men staggering along with all the gold dust they can carry.

Even women have secured small fortunes.

"'Several women have recently returned from Klondike, with gold dust valued at from 10,000 dollars to 50,000 dollars which they had dug up themselves.

"'Thousands of gold seekers of both sexes, and all classes, are hurrying to the Pacific coast cities in the hope of reaching Klondike, content with any mode of getting there.

The mining districts of the South being deserted.

"'The mining towns in Colorado, California, and Montana, are being deserted by the miners; every man with sufficient money is starting for Klondike. The same feverish excitement prevails in San Francisco and other Pacific coast cities, and the remotest parts of the country are rapidly catching the infection. Men of all classes are throwing up their work and starting for the land of gold. At Seattle half the police force has resigned, and the street cars have nearly ceased running, as a result of men leaving for Klondike.'"

Gold being shipped from the field by the ton even during this first season of the rush.

"According to the special correspondent of the *British Columbia Review* the shipments of gold from Klondike for the season approximate $20,000,000 equal to £4,000,000 sterling. Says the journal in question:—

"The richness of the auriferous gravel deposits on the banks of the Yukon River have been known and recognised on the Pacific seaboard for several years, but every succeeding summer has brought reports of new discoveries on the higher reaches of the river or tributaries, and coarse gold-dust has found its way into

the banks, until the recent arrival of two steamers at San Francisco with upwards of two tons of bullion from the Klondike diggings has created an excitement in Western America unparalelled since the Californian gold rush of '49 and the Cariboo excitement of 1858. Much of the dust lately brought down is very coarse, and the emptying of leather sacks on the bank counters, where several hundredweight of gold could be seen in one heap, has sent up a real and intense gold fever, the effects of which are plainly discernible in London.

To quote the New York correspondent of the *Daily Mail*:—

The New York papers confirm the reports of rapid fortunes being made.

"'The continued excitement over the Klondike gold discoveries, and a widespread demand for information about goldfields have resulted in the leading newspapers throughout the country issuing special supplements to-day, giving reports from Klondike, as well as the cost and the methods of getting there, and other useful information. The New York papers devote great space to interviews with lucky men from Klondike, who confirm the recent reports of rapid fortunes made in the diggings.'

New York "Tribune," July 14th, 1897.

The San Francisco correspondent of the *Tribune* gives some interesting particulars regarding the recent discoveries. He writes:—

Miners arriving with half a million dollars of gold.

"Forty Alaska miners came in here to-day (July 14) by the steamer "Excelsior," bringing over £500,000 in gold dust from the new Klondike mines.

"T. S. Lippy and his wife, of this city, brought down £60,000, which represents their work, since April, 1896. Mrs. Lippy, who is a small wiry woman, tanned black by the sun, was the first woman to cross over the divide

from the new Juneau to the new camp. She did much 'hustling' in the winter, and she showed a noble pair of moose antlers as a trophy of her skill with the rifle.

Gold stowed away in bags of hide, tumblers and fruit jars.

"As the United States Mint was closed for the day when the miners arrived, they packed their sacks of gold dust to Selby's office. There a picturesque collection of bags was produced. Some were made of deer hide, and held as much as $2,500.

"Several of the miners ran out of even canvas bags, and were forced to put their gold in tumblers and fruit jars, which they covered with writing paper. They looked like fruit or jelly put up by country housewives. All the bags were weighed, and then, as fast as the weight was recorded, they were slit open with a sharp knife and the contents poured upon the broad counter, which has a depression in the middle. The heap of gold dust looked like a pile of yellow shelled corn.

Bags of gold thrown under grocers' counters like bags of flour.

"At Dawson, near the camp, men come in and leave sacks of gold dust on deposit, and these are thrown under the counter by the storekeeper as though they were bags of flour. The whole country is wild about discoveries, and everyone who can get an outfit is pouring into Klondike."

London "Standard" August —.

The following are extracts from an article which appeared in the London *Standard* one day last week:—

Ample confirmation of reports.

"The recent discoveries of gold on the Klondike Creek afford ample confirmation of the reports brought us during the past few years of the auriferous richness of the Yukon Valley. . . . . .

14,000,000 dollars worth of gold expected this season.

"In 1895 the value of the gold obtained from the Yukon placers was 709,000 dollars. Last year the total was more than four times this sum; and this year it may be anything between ten and twenty times as much. If there is anything in the rumours which have come

along the last few days, other districts as rich as, or richer than, Klondike have been located. There is nothing inherently improbable in this; on the contrary, nothing could be more probable in the circumstances. Other districts richer than the Klondike in the North West Territory of Canada.

"Daily Telegraph," July 21st, 1897.

"There is every reason to believe that the Klondike Gold Field will rival those of California and Australia. Rivalling California and Australia.

"Mr. C. H. Mackintosh, Lieutenant-Governor of the Canadian North-West Provinces, admits the truth of the reports regarding the extreme richness of the district." Official confirmation of extreme richness.

"Financial News," London, 26th July, 1897.

"Among the people who have just returned from the new Klondyke gold mines are men who had been for more than ten years facing the dangers and hardships of the frozen North in the hope of making a rich find, and signally failed. Now they come back with fortunes stowed in their gripsacks and stories of untold millions to be picked up in the country of which so little is known. Marvellous wealth at last.

"Fine gold dust in small quantities was found at the mouth of the Porcupine River, a stream that joins the Yukon about 100 miles west of the boundary. Proof of heavy gold at Headwaters of the Porcupine.

"The gravel is frozen solid the year round, and has to be thawed out in some way before the gold can be separated. Purpose of portable steam boilers.

"Through the ice the miners burned holes with fire, and then blasted out the pay dirt on the benches of bed rock."

Rich prospect for Trading Companies.

"The *Alaska Mining Record*, published in Juneau, contains letters stating that the stories told are not exaggerated. 'One hundred dollars to the pan is very common. One can hardly believe it, but it is true, nevertheless. A very hard country to live in on account of the mosquitoes and poor grub, 'but healthy and a show to make a ten strike.' There is nothing a man could eat or wear that he cannot get a good price for. First-class rubber boots are worth from an ounce to 25 dollars per pair. The price of flour has been raised from 4 dollars to 6 dollars and was selling at 50 dollars when we arrived.' Another letter says:—'It will pay to bring anything here which can be carried in.'"

"Westminster Gazette," 21st July, 1897.

The world's richest Fields.

"The latest advices state that discoveries of a sensational character have been of almost daily occurrence in the Klondike district, and it seems now beyond doubt that one of the richest gold-fields hitherto known exists within Canadian territory on the Yukon."

INSPECTOR CONSTANTINE, January 23rd, 1897.

Prospects continue increasingly encouraging.

"Placer prospects continue more and more encouraging. It is beyond doubt that three pans on different claims on Eldorado Creek turned out 204, 212, and 216 dollars; but it must be borne in mind that there were only three such pans, though there were many running from 10 to 50 dollars."

Where a Company's prospectors will operate.

"There is an immense reach of country beyond which has not yet been prospected. . . . Of all the 200 claims staked out on the Bonanza and Eldorado Creeks not one has proven a blank."

INSPECTOR STRICKLAND, in the Toronto "Globe," August 3rd, 1897:—

An Official declares the goldfields to be inexhaustible.

He believes the placer goldfields of the country inexhaustible, as there are hundreds of streams known to be goldbearing which have not yet been prospected owing to scarcity of men and difficulty of getting food. . . . He had, himself, actually seen one ordinary mining pan yield 595 dollars worth of gold.

After gold is discovered, the miners cut down a quantity of timber, and then they burn a hole, or rather two holes, about 6 feet long by 4 feet wide, putting in two fires in each hole during the day. Each of these fires will probably burn out about 8 inches of dirt.

Present method of melting the frozen earth in order to mine it.

The Marvellous richness of Klondyke.

From the "Bullionist," 18th October, 1897.

The news from Klondike is of a mingled character, but nothing could be more emphatic than statements contained in the New York papers within the last few days as to the enormous quantities of gold obtainable in the neighbourhood. In a dispatch received by the *Journal* of that city from Mr. Joaquin Miller, the well-known American poet, who writes from El Dorado Gulch, Klondike, he says that "he has been fairly dazzled with gold." He describes in detail sixteen rich claims, several yielding over 80,000 dollars per foot. One owned by Captain Ellis, of California, yields over 1,000 dollars per pan, or 10,000 dollars every 24 hours. That gentleman showed Mr. Miller three bags, each containing 50 lb. of gold dust, also numerous oyster and tomato cans and old boxes filled with gold dust, and invited Mr. Miller and others who were present to help themselves. The latter remarked: "Wherever we go we find men with heaps of gold." On Sunday the *New York Herald* published a communication from Sitka, in the adjoining American territory of Alaska, announcing that marvellous gold discoveries had been made in Cook Inlet in the same region. The newly discovered gold-field is said to be easily reached, and to have a mild climate and a fertile soil.

A poet "dazzled" at Klondyke.

Visitors invited to help themselves to nuggets.

Another "marvellous" discovery.

London "Standard's" Special Correspondent, 26th August, 1897.

It is reported from Klondyke that miners who possess buckets full of gold are living on two spoonsful of beans and a bit of bacon daily. A steamer has started to return to the East with several tons of gold of the value of over three million dollars, heaped on deck, under

Gold heaped up like coal or potatoes.

tarpaulin, like so much coal or potatoes. M'Kay, a returning miner, says there is more gold than any man has yet dreamed of. A Correspondent, quoting the statements of this man, says the miners' tales make one's heart jump and the pulse tingle.

From the Special Correspondent of "The Standard" of London, 31st August, 1897.

The steamer "Portland" having failed to meet at St. Michael's the Yukon River steamer with its tons of gold worth several millions of dollars, brought to Seattle only 18 miners with 575,000 dollars of gold. . . . .

Official report of 70,000,000 dollars of gold in sight.

Mr. Ogilvie the Dominion Land Surveyor, whose capacity or integrity . . . . says, in November he informed the Authorities of the Dominion that 50,000,000 of gold was in sight. This quantity he now increases to 70,000.000.

Reuter's Agency, Seattle, August 30th.

The greatest gold find in the world's history

The Steamer Portland arrived here to-day. . . . She brought gold to the value of about 500,000 dollars . . . . Old timers, who realize the state of affairs, predict death and distress during the winter. Those who are returning now, however, admit that the strike of gold was, and is, one of the greatest in the world's history. They also predict further gold finds in future . . . .

From "Morning Post's" correspondent.

NEW YORK, *August 29th*, 1897.

Glowing accounts of the country's wealth. . . Gold galore.

"The steamer "Portland" arrived yesterday at Port Angeles with 100,000 dollars in gold, and a party of early pioneers returning home from the Klondyke gold-fields. The passengers are full of glowing descriptions of the mineral wealth of the country, and speak of gold galore in all directions. They say nothing of the terrors and privations described by later adventurers in the same region. They speak of a splendid gold discovery in the Monnet Creek, 800 miles from the mouth of the Yukon River, and outside the boundary of British America. The wealth there is said to exceed that in Klondyke. When asked to reconcile the smallness of the quantity of gold brought in his ship with the glowing statements of the

New discovery of gold near Junction of Yukon and Porcupine Rivers, exceeding Klondyke in richness.

passengers, the Captain of the "Portland" explained that he was compelled to leave St. Michael's before the arrival of the treasure boat from the Yukon. Mr. Ogilvie is quoted as saying that the 600 claims already staked in the Klondyke region will yield 70,000,000 dollars in gold to their owners."

Over £14,000,000 from the Klondyke Official estimate.

"Standard" (London) 27th August, 1897.

REUTER'S—VICTORIA (B.C.), *August 26th.*

According to an apparently authentic report from Dawson City, gold to the value of six million dollars is there awaiting shipment in June.

6,000,000 dollars worth of gold awaiting shipment.

"Daily Chronicle," 4th September, 1897.

A report received at the Department of the Interior to-day (Washington, 3rd September), from the Governor of Alaska, states that two-and-a-half (2½) tons of gold dust have been shipped this season from Klondike.

New discoveries of gold are constantly being made.

Mr. Thomas Deasy, Chief Officer of the Fire Department of Victoria, British Columbia, writing to Commander Wells, R.N., Chief Officer of the Metropolitan Fire Brigade, on August 27th, 1897, states:

"Situate as the writer is at Victoria, the nearest shipping port to the mines, he has an opportunity to truthfully depict everything connected with the greatest goldfields on earth. From Cassiar to Alaska, covering thousands of miles of Canadian territory, gold has been found. Scarcity of provisions and long distance from civilisation retarded the miner. The frozen North had terrors which only the most hardy of mankind could endure. Snow and ice, precipices and gorges, dangerous rapids on the rivers, impenetrable woods on land, every mile meant privation. At last a whisper was circulated in the nearest camps that untold wealth could be found further up river. Places where miners made good pay were deserted. Towns and villages added hundreds to the rush. Eventually the news reached cities, and thousands are on the way to the Mecca of the North. At the present writing two steamships are on the way

The greatest goldfields on earth.

out with tons of gold. The great Yukon country is no place for the 'tenderfoot.' Strong men, with means enough to outfit for a year or two, will be successful. The country will produce more wealth each succeeding year. It is practically undeveloped. Hundreds of thousands will scatter over the numerous creeks and rivers, eventually opening up mines on the Peace, Pelly, and Mackenzie. From this city many left in the first mad rush, and many will return to winter. Those remaining took into consideration the difficulties to be surmounted, and preferred to await until next spring. If 10,000 men should delve all the coming winter, only a small expanse of territory will be opened up.

Mines will be opened up on the Mackenzie.

New Gold discoveries of great richness.

The first copy of the *International*, published at the new town of Warder, on Lake Tagish, in June this year (1897), states :—

Two prospectors have come in from the middle fork of the Salmon River, a section that has never been explored, bringing a quantity of gold taken out there in a few week's work. The amount of their cleanings was close to 1,000 dols. An interesting feature of the matter is that this gold is washed from the decomposed surface of a mountain which they declare to be all ore. The mountain is porphyry. The gold is found all through it. They do not claim the rock is high grade, but they assert that it is all good ore. A. H. Pettengill, ex-chief deputy county auditor, who now owns and operates mining interests on Upper Kettle river in Stevens Country returned to Colville recently from a trip across Colville reservation, and if his statements are true, the portion of the Colville reserve lying along the boundary line between Stevens and Oakanogan Counties will rival even the palmiest days of Cripple Creek. A Mr. Allison bonded the claim from the original owners for 10,000 dols. In a very short time he secured 30 sacks of ore. No one is allowed to visit the works of the mine, which are a little more than the mere uncovering of the vein.

How wide the pay-streak is, is yet a matter of the most random conjecture, but no one will doubt that it is wide enough, for out of less than 50 lbs. of the ore from the ledge, 800 dollars in pure, yellow gold was pestled out in a common mortar.

A Quartz Reef on the White Pass.

The correspondent of the *Pall Mall Gazette* writing from Vancouver, on September 9th (1897), states that news had just reached Vancouver of the discovery of a ledge of quartz 20 feet wide, which assayed from 86 to 73 dols. per ton.

It was discovered by a man named Wade, who, on a trip from Lake Bennett, at a point contiguous to the White Pass, picked up four pieces of quartz rich in gold. He then uncovered the ledge above mentioned with a wooden spade and took some pieces to the Treadwell Mine for assay.

A Stupendous Output of Gold predicted for 1898.

The *Daily Mail* correspondent states in the issue of October 11th, 1897—"Judge Malony, of Juneau, Alaska, who is returning with a party from Klondyke, says that not one-fifth of the gold now in sight has yet come out of Klonkyke. He is afraid to offer predictions of a fabulous yield, lest he might be charged with exaggeration. Mr. Galvin, of the same party, who sold one claim on Bonanza Creek for 100,000 dollars, predicted that 250 tons of gold, or 130,000,000 dollars would be shipped from Klondyke next year. His companion placed the amount at 300 tons."

"Westminster Gazette," 10th November, 1897.

Previous account of Klondyke's great richness confirmed.

The son of Mr. Lyman Gage, the Secretary of the Treasury, has just arrived at Butte, California, from the Yukon gold district. He confirms previous accounts of the richness of the Klondyke Valley, and asserts that the first steamer that gets away in the spring will bring 15,000,000 dollars worth of gold from the Klondyke.

Interview with Mr. HARRY de WINDT, in "Strand Magazine," October, 1897.

The big boom (on the Yukon) commenced in September, 1896, when one George Cormack found gold in large quantities. Then came the inevitable rush. In the following Spring, when water was available, gold was washed out in pounds' weight. Four pans went as high as 200 dollars. The pan, about which one hears so much, is an ordinary sheet-iron thing of 18 inches circumference and 4 or 5 inches deep. Some men made money at the rate of 17 dollars *per minute*, and fortunes of 100,000 dollars were made in less than two months, although the miners had only just commenced to work their claims.

The Great "Rush" of 1898.

Mr. H. DE WINDT in the Strand of October, 1897.

The spring of 1898 will see *the* great rush, but there's plenty of room. 100,000 miners might go prospecting in the Yukon Valley, and be lost to one another. My impression is that there are streams richer even than the Klondike—the Pelly, the Lewes, the Porcupine, the Big Salmon, the Tanana, the White, the Hootalinqua, and the Stewart Rivers, for example, especially the last-named. All are navigable tributaries of the Yukon.

REUTER'S TELEGRAM,
VICTORIA (B. C.),
October 11*th*, 1897.

Miners are coming out overland from Klondike, with large amounts in gold and drafts.

They report a shortage of provisions, but declare that the richness of the goldfields is not exaggerated.

"DAILY MAIL," 12*th October*, 1897.
TELEGRAM FROM ITS B. C. CORRESPONDENT.

One year ago, Alexander Macdonald, a Yukon prospector, was penniless; to-day he is believed to be the richest man in Klondyke, and unable to tell whether he is worth 5,000,000 or 20,000,000 dollars until the clean-up next spring. A year ago he could not pay cash for his food.

Klondyke's Marvels, by a Yukon Pioneer.

"Daily Chronicle," London, 26th October, 1897.

Mr. A. E. Sola, a young Englishman who has made his fortune at Klondike, is at present on a visit to this country, writes a *Chronicle* contributor, and it was my good fortune to have a chat with him yesterday at the Hotel Cecil, where he is staying.

Mr. Sola is now managing director of the British North American Trading and Exploration Company of New York, having transferred to it for a good round sum his claims in Klondike, and thus having passed beyond the miner's stage, is in a position to speak freely touching Klondike, its hardships and its resources. Mr. Sola can speak with authority both as to the hardships and resources of Klondike. He spent from three to four years out in that terrible region; though he has amassed a great fortune, he still shudders to recall the sufferings he underwent during his four years' search for gold.

"What is the truth about Klondike, Mr. Sola," I began. "Is there gold there or not?"

Gold; the prodigious yield which Klondyke will give.

"Gold. Why there is, in my opinion, so much gold there that gold may yet be demonetised owing to the prodigious yield which the Klondike district will give. Why, the supply has as yet scarcely been tapped. There has been up to the present a slight trickle of gold, but the main stream of precious metal has yet to flow. I say 'yet,' you observe. The gold standard will not be with its back to the wall yet awhile, for the reason that the luck of winning gold at Klondike is surrounded with such awful hardships and such perils. But when the difficulties of access to the region have been overcome, when the transport question has been solved, and the present comparatively rude methods of getting the gold have given place to more scientific methods, there will be a rush of gold from Alaska which will astound the world. I was there from three to four years, and perhaps I ought to know something. . . . To go there without £400 or £500 is to court disaster, disappointment, and possible death.

There will be a rush to Klondyke that will astound the world.

A Miner's Life on the Klondyke.

In winter the Klondyke is reached by travelling over the frozen lakes and rivers.

"Say, now, a man arrives at Dawson City with a year's supplies," Mr. Sola went on. "He will naturally wait until the cold weather freezes the river, and he can take his provisions on a sledge with dogs, if he can buy the dogs. He locates a claim at last. He has to build a log cabin, by no means easy work in winter time. He then builds a big fire, which is left to burn on the bank, the snow having first been cleared away from the ground. The fire burns all night, and the next morning the miner starts to dig the thawed earth. Then he must put in another fire and again dig, keeping this up until he strikes bed rock, twenty feet down, and perhaps he finds no gold there in paying quantity. He must build another fire, and start another hole somewhere else. He will be disgusted after several of these holes are made, and will have to clear out and start another claim. Now that may go on time after time, unsuccessful always until the man's heart is broken and his patience exhausted. Now that is what happens in the great majority of cases. A pretty prospect, isn't it?"

Heartbreaking work searching for gold on the Klondyke.

A New Field in Alaska.

St. James' Gazette, October 18th, 1897.

A new field to divide attention with Klondyke.

The New York "Herald" publishes a despatch from Sitka describing the wonderful gold discoveries at Cook Inlet, Alaska, in United States Territory. The newly discovered region is easily reached, and has a mild climate and fertile soil. A party of miners from the new gold-fields have, it is stated, reached Sitka with over 200,000 dollars in gold dust and nuggets. It is generally believed in New York that this district will divide attention with Klondike next year.

An Interview with an Alaskan Pioneer.

"Pall Mall Gazette," October 28th, 1897.

Governor Mackintosh's sample of Sub-Arctic America

Mr. F. G. Hinde Bowker (whom the Hon. H. C. Mackintosh, at a banquet given him in London in September, in reply to Lord Dufferin's compliments,

facetiously introduced as an example of the effects of life in the North West territories of Canada on the human constitution) was recently interviewed by a correspondent of the *Pall Mall Gazette*. He stated that he went to Alaska with Lieut. Swatka on an expedition to Copper River and had been there ever since—over nine years—until he returned to England.

"A month or so ago, and am going out again as soon as I can get away.

"I never suffered from want of fresh meat all the time I was out there. There are any quantity of Moose and Cariboo in the interior. Plenty of meat.

"The climate, is of course, severe to the new comer. The winter is a bit tedious but the yarns of the perpetual Arctic night are the merest bunkum. Even at its worst there is always light from 9 o'clock in the morning to 3 o'clock in the afternoon, and in the summer months it hardly ever gets dark." The report of a perpetual Arctic night merest bunkum.

It was not easy to picture to oneself that the tall indolent figure in immaculate evening dress, who interspersed his conversation with critical comments on the quality of his Kümmel, was the man who, for the last ten years, had roughed it at the back of the beyond. He seemed, as he lolled in a comfortable armchair in front of the fire, to be recounting, with languid impartiality, the experiences of another man in whom he was mildly interested, to be telling, without a tinge of boastfulness or vain-glory, a story of very matter-of-fact achievements—a typical pioneer of the Empire at the end of the nineteenth century. The effect of ten years in the far North West.

"Does it pay, all this?" he continued, in answer to a question I had slipped in. "There can be no doubt about that. The second year I was out there I washed out 2,000 dollars worth of gold. And now? Well, that is my own business, and no one's else's, isn't it? But last year, in Dawson City, I met two partners who had made 150,000 dollars as the result of two months' work. Many of the fellows out there made anything between 100,000 dollars and 50,000 dollars during the year. Does it pay?

Dawson City, when I left last spring, had about 8,000 inhabitants, and most of them were doing well. No; all things considered, when I left, the prices of provisions were not exorbitant. Two American transport companies were catering for Dawson City, and, on the whole, traded on fair lines. The normal price of a sack of flour was about 6 dollars, though in times of scarcity I have known it go as high as 50 dollars. Beans which, after flour, was a staple food, were sold for 15 cents a pound; a pound of bacon cost 50 cents; a pound of coffee 25 cents; a pound of tea one dollar, and so on in proportion to the goods. The yarns of the startling prices you were just referring to are either apocryphal, or are the result of exceptional circumstances. Trade with the natives, for example, deals in fancy values. I, myself, have sold a sack of flour for 60 dollars. You see, a native comes along with a leg of moose. He offers it for sale. I ask him how much he wants for it. He says 60 dollars. What does he want to buy? A sack of flour. Well, I happen to have a sack of flour to dispose of. What is the price of it? Sixty dollars! Very good; he will take that sack at my price, and I get my leg of moose. You see its nothing but barter on the hard pan, but the figures are picturesque. This winter there probably will be some famine prices, and a good deal of real hardship.

Trade with the Natives.

Will new-comers have a chance?

"And will the new comers have a chance this spring?"

"Certainly. Why not? There is plenty of room in the country, and there is gold in every creek, I believe. The Stewart River, for example, has not been touched, and I should not be surprised if it did pan out richer than the Klondike. What I should advise young fellows, who are not afraid of roughing it, to do is to form an expedition of some ten or a dozen strong. They should make a headquarter's camp in some unexploited district, and then every man ought to go off on his own account and prospect, with the camp to fall back on. You can cover a lot of ground by that method. Every man should have a capital of at least £200, and provisions for two years.

Prospects on the Stewart River.

Then, even if he does not strike it rich, he cannot come to much harm. But it is no use going out there without some funds, and without proper equipment. Oh, yes, there will be a big boom in Klondike next spring. And, as one result of it, some fair rubbish will be shot on the market over here by the small companies. You see, I know the sort of claims some of the promoters have bought. I could tell you a story about a certain syndicate. However, I wont. In fact, I could tell you several stories——"

A big boom next spring.

Interview with a Klondyke Miner.

"Star," 1st November, 1897.

Mr. Fred Price, of Wimbledon, who lived at Seattle for ten years, and then went to the Yukon goldmining in 1894, stated recently to a *Star* reporter:—"I'll tell you how rich the diggings are. Imagine a stretch of ground 80 feet wide from Wimbledon to Waterloo. Well, that is the Bonanza Creek. It yields from 50 to 1,000 dollars a yard. And remember that is merely *one* pay streak on the Klondyke."

50 to 1,000 dols. of gold to the yard.

"What do you think of the Klondyke promotions?"

"I do not think any syndicate has got hold of many first-class claims. You may depend upon it that if a man has a good one he won't be in a hurry to part with it." Mr. Price returns to the Klondyke next March to look after his claim.

Outlook for syndicates.

Ontario Mining.

"Times," 12*th October*, 1897.

In the opinion of some mining experts the Western Ontario goldfields are as promising as any recently exploited. Mr. Blue, Director of the Ontario Bureau of Mines, who was sent by the Provincial Government to the newly-discovered fields along the Michipicoten River, reports to the Government a new vein of extraordinary richness struck near Wawa Lake, assaying 600 dollars to the ton, and states that these results seem likely to be maintained.

"Times" (London), October 13th, 1897 (Reuter's Cable).

Richness of goldfields not exaggerated.

Miners are coming out overland from Klondike with large amounts in gold and drafts. They report a shortage of provisions, but declare that the richness of the goldfields is not exaggerated.

"The richest man in the world."

"Canadian Gazette," October 7th, 1897.

Mr. Joaquin Miller, in a recent letter from Dawson City, speaks of Alex. Macdonald as "The John Mackay of the Klondike," and adds, concerning him: "They say Macdonald is a very conservative man in his calculations. He made his millions by locating claims, having nothing at all to begin with but a rich claim, not a dollar to buy with. I hear he is probably the richest man in the world." Mr. Macdonald referred to is a Canadian, a native of Ashdale, Antigonish county, Nova Scotia.

Mr. Wm. Ogilvie on the Yukon Goldfields.

The "Manchester Guardian," 21st October, 1897, from its Correspondent, Montreal, October 9, states:—

Mr. William Ogilvie, of the Dominion Land Survey, has returned to the Pacific Coast from the Klondike, where he has spent the last two years as the representative of the Dominion Government. Mr. Ogilvie first went into the Yukon country many years ago to delimit the frontier of Alaska, and he has been there, with occasional furloughs, ever since. His official reports give the only trustworthy information published as to the Klondike goldfields, and his return to civilisation has therefore been eagerly looked for. While protesting against the exaggerated reports published in the newspapers as to the fortunes made in the new goldfields, Mr. Ogilvie admits that the deposits are of extraordinary richness. In an interview he has stated that he believes that one hundred claims on Bonanza Creek and forty on El Dorado will yield about 60,000,000 dollars before they are exhausted. In addition to this there is a vast unexplored region from

The only trustworthy information.

Mr. Ogilvie admits the extraordinary richness of the gold deposits.

60,000,000 dols. worth out of two creeks only.

which returns almost as great may be looked for, and Mr. Ogilvie estimates that while the greater portion of the work will be done within the next ten years, there is every indication that placer work will be continued for at least twenty years, and this without any attention being paid to the quartz mining which, it is certain, will follow the hydraulic operations. Talking of the reports of wonderful amounts of gold taken out in a single pan, Mr. Ogilvie gave some of his own experiences. Mr. Ogilvie went into one of the richest claims and asked to be allowed to wash out a panful of gold. The pay streak then was very rich, but standing at the bottom of the shaft, looking at it by the light of a candle, all that could be seen of the pay streak was a yellowish-looking dirt, with here and there the sparkle of a little gold. Mr. Ogilvie took out a big panful and started to wash it out, while several miners stood about guessing as to the result. Five hundred dollars was the top guess of the miners, but when the gold was washed, dried, and weighed it came to a little over 590 dollars. Speaking of the quartz to be found in the Yukon, Mr. Ogilvie stated that he had made a number of tests roughly for several men. One man brought in a sample from a quartz ledge which he had discovered. Mr. Ogilvie weighed out several samples, crushed them, washed out the gold, and found that the ore made 1,000 dollars to the ton even by that crude method. Other samples he tried made 100 dollars more. If the ore had been properly crushed and quicksilver used to amalgamate, the results would presumably have been much higher.

Wonderful amounts of gold out of single pans.

Quartz on the Yukon yielding 1,000 dols. worth of gold to the ton.

Value of Yukon Gold.

"Engineering and Mining Journal, 9th October, 1897.

According to the officers of the Selby Smelting Company, gold nuggets from the Yukon are worth from 17 dollars to 18 dollars per oz., and gold dust from 16 dollars to 17 dollars per oz. The Yukon gold contains a large proportion of silver and some iron, the latter giving it a fine rich colour.

Section 2. Quartz Reefs in the Mountains and at the Headwaters of the Rivers.

Extracts from the Report of Mr. WILLIAM OGILVIE, 1896.

Gold-bearing quartz picked up.

Pieces of gold-bearing quartz had frequently been picked up along the river in the shallow drift, but none had been found in place, nor did it appear to me that much search had been made for it (no quartz crushers being on the field miners had no inducement to look for quartz reefs).

The quartz from which all this gold has come will yet be discovered.

I think it may, with confidence, be asserted that rich finds will yet be made of both coarse gold and gold bearing quartz. It is not likely in the nature of things that such a vast extent of country should have all its fine gold deposited as sediment, brought from a distance in past ages of the world's development. If this is not the case, the matrix from which all the gold on these streams has come must still exist, in part at least, and will no doubt be discovered, and thus enrich this otherwise gloomy and desolate region.

Gold-bearing quartz found at numerous places in this North-West Territory.

From the indications I have mentioned it will be seen that this corner of the North-West is not going to be the least important part of it, more especially when we consider the fact that gold-bearing quartz has been found in it at numerous places, and much will no doubt be worked.

Good quartz found on the hills,—copper and silver also found.

Good quartz has been found in places just across the line on Davis Creek. . . . Good quartz is also reported on the hills around Bonanza Creek. . . . I have seen several lumps of copper brought by the natives from White River. . . . I have also seen a specimen of silver ore said to have been picked up in a Creek flowing into Lake Bennett.

CUDAHY, 22nd January, 1897.

A quartz lode showing fine gold in paying quantities has been located on one of the creeks, but I cannot yet send particulars. I am confident from the nature of the gold found in the creeks that many more of them—and rich too—will be found. Quarts found.

CUDAHY, 23rd January, 1897.

I have just heard from a reliable source that the quartz mentioned above is rich, as tested, over 100 dollars (over £20) to the ton. The lode appears to run from 3 to 8 feet in thickness.

"Financial News," 13th August, 1897:—

CHICAGO, August 11th.—A gigantic Chicago Corporation, with a capital of £5,000,000, has been organised to get at the gold quartz mines in Eastern Alaska. John Cudahy, the packer, is at the head of the Company. New York and London syndicates are, it is alleged, trying to get the property, but without success. Quarts reef Exploring Companies for Alaska.

Extract from Inspector Constantine's Report, January 20th, 1896.

"The country is full of quartz ledges, more or less valuable, and it only requires a short way of getting in from the south, with the assurance of a certainty of supplies, in order to develop them. . . . In a country where a man has to pole up a rapid river for some hundreds of miles in summer, then pack his food, clothing, camping and working tools on his back, or in winter either haul himself or with a dog, consideration as to where he can get his food and clothing is of vital importance to him, and he is governed accordingly. This accounts for the number of men working on the Forty-Mile and creeks emptying into it. Even here food has to be packed on men's backs in the summer at a charge of 1s. 6d. per pound, and in winter by dogs at 5d. per pound. This is for about 85 miles only. . . . Quarts Mining prospects

Prospects for land transportation Companies.

The work done so far has shown up a large yield of gold. . . . The true value of the mineral wealth of this part of the country will not be known for many years, as new discoveries are being made each season. . . . Gold has also been found on Indian Creek, Squaw Creek, and other small streams flowing into Yukon from the Eastward."

The Peel River route will reach the richest streams.

The best paying streams are those running into the Yukon from the East.

Extract from Inspector Constantine's Report, November 20th, 1896.

Means required for getting Quartz Machinery on the field. See Peel River route.

"Many old miners state that this Creek (the Klondyke) is fully as rich as any found in California in the early days. New creeks are being found daily, all prospecting well. . . . Without doubt before long rich quartz will be found, but not worked until some means of transporting the necessary heavy machinery is provided and supplies can be got in at reasonable cost."

On January 23rd, 1897:—

£20 per ton quartz reefs.

"A quartz lode showing free gold has been located on one of the creeks. The quartz I understand from a reliable source, is rich, as tested over 100 dollars to the ton. The lode appears to run from 3 to 8 feet in thickness, and lies about 19 miles from the Yukon River. Coal is found on the upper part of Klondike, so that the facilities for working are good and convenient.

"Standard" 31st August, 1897.

Quartz lodes practically inexhaustible 1,000 dollars to the ton.

. . . He (Mr. Ogilvie) also tested the quartz and found it yielded at the rate of 1,000 dollars per ton. . . The quartz lodes are practically inexhaustible.

"Daily Chronicle" Correspondent's interview with Dr. GEO. M. DAWSON, C.M.G., F.G.S., Ottawa, August 16th, 1897.

The mountains to the Arctic Sea rich in minerals.

"The entire range of mountains which extend more or less continuously from the extreme end of South America to the Arctic regions is rich in minerals.

Take . . . . for example . . . . until the recent Klondike discoveries appear to throw previous placer mining into the shade. . . .

. . . . Where such large deposits of heavy placer gold have been found there must have been at some time large quantities of gold in quartz at no very great distance, and these quartz veins still exist. Rich quarts in the hills where the rivers rise.

Financial Bulletin, August 21st, 1897.

Another phase of the possibilities of the Klondike that has been overlooked is the fact that where there is so much placer gold in the beds of streams there must be contiguous quartz ledges. When the placer gold becomes scarce, ledges will be searched for and found, and then a second era of prosperity will have come, which will be more lasting than that which is now in progress.—*The Roslander, July 27th*, 1897. There must be contiguous quartz ledges.

Section 3. Source of the Klondyke Placer Gold.

"Chambers' Journal," September 4th, 1897.

There is no reason to suppose that even the Klondyke is the very richest of the rivers which flow down from the Rockies and carry with them the drift from the auriferous rocks. Between the left bank of the Yukon and this mountain range is a vast region absolutely untrodden by man. It contains, in the upper reaches of the Stewart and Macmillan Rivers, hundreds of creeks quite as favourable for the reception of floating particles of gold as the Klondyke. And even this river remains unexplored beyond the place which the Indians know as Too-much-Gold Creek. Dr. Dawson estimates that the auriferous alluvium in and around the Yukon watershed Gold on the upper reaches of the Stewart and Macmillan Rivers.

is spread over an area of a round quarter of a million square miles. This estimate takes no account of the possibilities of lode-mining in the hills where the quartz veins exist. The placers of the Klondyke appear, as we have hinted, to have their origin in the Rockies; but no scientific investigation has yet been made with the idea of locating the veins, and of ascertaining their approximate extent. But a United States Geological Survey party last year found in a range of small mountains situated between the Yukon and the Tanana and crossing the Alaskan boundary in a north-easterly direction not far from Forty-Mile Creek, evidences of quartz gold which persisted for over 500 miles and gave promise of the presence of the metal 'in well-nigh unlimited' quantities. This range joins the Rocky Mountains a little north of the Arctic Circle.

The placers have their origin in the Rocky Mountains.

Quartz reefs extending to the Rocky Mountains.

(*See also Section* 2.)

Quartz Reefs in the Rockies towards the Mackenzie River.

The "Investors' Review," October, 1897.

The United States Geological Survey has discovered auriferous rocks of "well-nigh unlimited capacity" in a range of low hills running between the Yukon and the Tanana to the north-east, and crossing from American into British territory near Forty-Mile Creek. But the veins from which the fine gold of the Klondyke creeks has been washed by the action of running water *must be located in the Rocky Mountains* which trend to the north-west between the Yukon and the Mackenzie, and in which the Klondyke, Stewart, Macmillan, Pelly and other rivers take their rise.

The origin of gold in the Rockies where the Stewart, Macmillan and Klondyke rivers rise.

Quartz Reefs on Stewart River and Headwaters.

"Globe," 9th August, 1897.

Writing from San Francisco, a correspondent of the New York *Tribune* says:— . . . The latest rumour from Alaska is of wonderfully rich quartz in large

quantities on the Stewart River . . . the ledge a large one . . . rock assays 300 dols. . . . This, if true, means much for the Klondike district.

Quartz reefs on the headwaters of the rivers.

The Stewart River runs into the Yukon not far above Dawson, and it is reasonable to suppose that the placer gold now being found below may have its origin in the mountains at the head of Stewart River and neighbouring streams.

Formation of the Yukon Goldfields.

The following recapitulation of a long Article upon the Alaskan Goldfields follows an Article in the *London Mining Journal*, of October 2nd, 1897, by Russell L. Dunn, M.E., from the *Mining and Scientific Press*.

Derivation of placers.

1. The placers are derived from the direct erosion of gold-bearing lodes in place by frost and flowing water.

Type of the Yukon placers.

2. The placers are the beds of the first few cutting channels that the living streams made in eroding the flat valleys they now flow in. These old beds, lying side by side, aggregate a width several times the living river, but at the same time have several times less width than the valleys. The old beds preserve an approximately direct course through the linear extent of the valleys, and have the same grade as the valleys. The old beds are not exposed at the surface, but are covered with from 8 to 20 feet of silt, so that there is no surface indication of their locus beneath the silt. (This is the type of placer; there are, of course, modifications of it likely to be found.)

Richness of Klondyke placers possibly exceeded by other discoveries.

3. The richness of the Klondyke placer discovery is likely to be equalled by many discoveries yet to be made, and is possible of being exceeded in richness by some of them.

The sources of the Gold at the up-stream end of the placers.

4. The lodes from which the gold of the placers has come, are, for the greater number, at or about the up-stream end of the placers. The lesser number of them may be, however, considerably farther down stream, and some even exist wholly within the placers. These lodes have not been eroded very deeply; and so closely are they connected with the placers, that richness in the latter furnishes a presumption of richness in the former.

Placer Gold not the result of glacier erosion.

5. Certain popular opinions, and some so-called expert ones as well, are absolutely to be rejected as erroneous. The gold was not broken out of the rock and distributed by glaciers. If it were in Alaska, one would naturally search for gold in moraines and not in flat valleys, far away from them. Gold does not "flow" now, and never did; otherwise it would be in the living rivers as much as in others. Every valley and flat in the auriferous region does not contain placers. All the bedrock underlying a valley in which a placer has been found is not a "placer"; it is not possible to find gold everywhere in such valleys as the Klondyke, for example. The entire length of a placer is not of possible equal richness, nor is the locus of the portion of greater richness an uncertain or indeterminate fact.

Character of the country; the placer ground frozen to the bedrock.

6. To the preceding add that the surface of the country, valley and mountain is covered with a deep strong growth of moss; that the silt and auriferous sand of the valleys beneath the moss is perpetually frozen to the bedrock; that from these physical conditions the methods of prospecting for placers and lodes employed elsewhere are impossible of application here; and one has clearly in view the special and, in part, unique mining conditions of the Yukon Goldfields.

(*See also Section* 2.)

"Westminster Gazette," 24th August, 1897.

Rich gold quartz at the Headwaters of Rivers rising in the Rocky Mountains.

An interesting item appears to-day in the *Morning Post's* New York letter to the effect that the nuggets brought to Seattle from the North-West Goldfields by the *Starr* on Saturday are of such different formation

from nuggets which have previously arrived from Klondyke that experts believe they probably did not come from the placer mines with which the world is now so familiar. These experts have for some time believed in the existence of ledges of rich gold quartz at the head waters of the Klondyke River, and the nature of the samples in question confirms them in their opinion.

Section 4. Other Minerals.

General Summary from the Committee.

Other mineral productions in this (the N. W. Territories) area are silver, copper, iron, graphite, ochre, brick and pottery clay, mica, gypsum, lime and sandstone, sand for glass and moulding, and asphaltum, while the petroleum area is so extensive as to justify the belief that eventually it will supply the larger part of this (the American) continent and be shipped to England.

Salt, coal, sulphur, and iron of great commercial value.

Salt and sulphur deposits are less extensive, but the former is found in crystals equal in purity to the best Rock salt, and in highly saline springs, while the latter is found in the form of pyrites, and the fact that these petroleum and salt deposits occur mainly near the line of division between deep water navigation and that fitted for lighter craft, gives them a possible great commercial value.

Evidence of the Rev. E. PETITOT.

The great mineral deposits of the Porcupine River.

The Gorges or Ramparts of the Porcupine River offer a vast and magnificent field to the geologist and the mineralogist.

The Neptunian and Plutonian elements have united there to form rocks and soils of an extremely varied nature. . . . Coal, anthracite, gneiss, red ochre, trap, porphry, marble, feldspar—pure and rose-veined, all the varieties of granite, gypsum, sulphur, talc, blue marl, and a quantity of other mineral substances show themselves in profusion in this canyon. Moreover, the rocks, by their singular and capricious forms, as well as by their striking, and one might say, improbable colours, present to the brush of the landscape artist scenery of a rare and striking character.

Evidence of DONALD McIVOR.

Coal, iron, &c., in the Basin of the Mackenzie River.

Iron could be found throughout the whole country. Coal in great abundance on banks of the Mackenzie. White clay on the river most valuable for pottery. Quantities of lime and sandstone. Of course, petroleum is well known to be in large quantity.

"Daily Chronicle," July 29th 1897.

Mineral resources far richer than supposed.

"Yet the resources of the country are far richer than is generally supposed; it abounds in every direction in gold, silver, lead, copper and coal, and quite apart from the recent discoveries in the grim district around the Yukon River, the immediate future . . . . is one full of the brightest promise."

Evidence of M. McLEOD, Esq., Q.C., Ex-Judge.

Large deposits of sulphur at the mouth of the Mackenzie.

Sulphur seems to permeate the whole of the region largely, because approaching the fires near the mouth of the Mackenzie (in the river) travellers speak of sulphurous exhalations.

Evidence of BISHOP CLUT.

Other minerals in abundance, copper, salt, sulphur, gypsum, and precious stones

There is copper (in the Mackenzie Basin and N. W. Territory), and one river bears the name of Coppermine River. It is found there in great pieces. I have seen little crosses made of it by the savages themselves. . . The sulphur abounds in several places. I have seen it on

the Clearwater River and on the West bank of Great Slave Lake. It is there in such quantities that the odour is annoying to those who pass by. Near Fort Smith there is a salt mine, which is probably the most beautiful and the most abundant in the universe. There is a veritable mountain of salt. By digging a little in the earth, from six inches to a foot, rock salt can be found. . . . . You have only to shovel, and you can gather a fine salt, pure and clean.

On the borders of the Peace River, stones are found which are sufficiently precious to make rings of them. I have seen Gypsum along the Mackenzie, a little below Fort Norman.

R. G. McCONNELL, 1888-89.

Petroleum and Pitch.

The Devonian rocks throughout the Mackenzie Valley are nearly everywhere more or less petroliferous, and over large areas afford promising indications of the presence of oil in workable quantities . . . . Near Fort Good Hope several tar springs exist, and it is from these that the Hudson's Bay Company now obtain their principal supply of pitch . . . . Still farther down, in the vicinity of Old Fort Good Hope, the river is bordered for several miles by evenly bedded dark shales of Devonian age which are completely saturated with oil (Fort Good Hope is 274 miles from mouth of the Mackenzie River).

The oil fields of Pennsylvania and Baker already (1888) show signs of exhaustion, and as they decline the oil fields of Northern Canada will have a corresponding rise in value.

Mineral Resources of the N. W. Territories.

Evidence of Professor BELL before the 1888 Committee.

Gold has been found at Repulse Bay and near Chesterfield Inlet, Hudson's Bay; also at Burntwood Lake, near Frog Portage.

Nuggets of pure silver have been found on the Upper Peace.

Native copper on the Coppermine River, and copper ore on the West Coast of Hudson's Bay.

Clay iron-stone on the Athabasca River, above the Clearwater River; and magnetite at Black Bay, on Athabasca Lake.

Sulphur is abundant in the form of pyrites on the West Coast of Hudson's Bay.

Salt, in springs on the Clearwater and the Athabasca, and copiously on the Salt River on the West side of Slave River.

Petroleum and asphaltum on the Athabasca River, Great Slave Lake, Mackenzie, &c.

Gypsum at Peace Point, Peace River, Salt Springs, Salt River.

Lignite, along the Athabasca River, Mackenzie River, near Great Bear Lake River, along Peel River and on the coast of the Arctic sea on both sides of the Mackenzie.

Plumbago found near Fond du Lac, Athabasca Lake.

Mr. George Dawson stated to 1888 Committee :— The pitch of Athabasca River (and also of the Lake and of the Mackenzie River) may probably be of considerable value in the future, but it is most important in giving reason to believe that extensive deposits of petroleum exist in the country in which it occurs. Mr. Hoffman reports on an examination of this material (1881-82) :— He suggests its use for asphalting roadways, &c., and for the purpose of distillation and for the production of lubricating and illuminating oils.

Professor Bell, in his evidence to the 1888 Committee of the Senate, stated—"As to economic minerals, magnetic iron, apparently of fine quality, judging from specimens I obtained at Fort Chippewyan, is found near the entrance of Black Bay, on the north side of Lake

Athabasca. Graphite has been found in loose pieces, near Fond du Lac Post, on the same side. Mr. Cochrane found the Huronian foundation, which is always apt to be metalliferous, well developed in Black Bay, and again between Fond du Lac and the eastern extremity of Lake Athabasca.

"The lake is deep and navigable for steamers of a large class."

Evidence from the diary of ANDERSON, the Explorer, Senate Committee, 1888.

Sulphur, coal, oil, salt, etc.

Red earth, sulphur, coal oil, salt, white earth, limestone, ironstone, and sandstone, are found all along the Mackenzie and the Athabasca. Mr. James Anderson, son of the Explorer, declares that he has seen all these minerals, himself, in the localities mentioned.

Evidence of G. M. DAWSON, Director of the Geological Survey of Canada, to the 1888 Senate Committee.

Vast copper deposits; no means of reaching them.

Referring to the Coppermine River particularly, there is every reason to believe there is a repetition, along that river and in its vicinity, of those rocks, which contain copper, on Lake Superior, and which have proved so rich there. If there were any way of getting the copper out from that country, as there will, no doubt, eventually be, it could be examined and prospected and worked at once. At the present time it seems to be beyond the reach of the prospector. The Hudson Bay Co. sent Hearne up there in the latter part of the last century to discover where the copper found in the hands of the natives came from, but he could do nothing but report that he found copper there. The sea to the north was ice-bound, and he did not see his way to utilising it, so it has remained ever since. With respect to the barren grounds, I know nothing personally. I think we really know very little about them yet. It would appear that the barren grounds have been generally characterised on the result of a very few expeditions which have not gone over them at all extensively.

Pitch and Asphaltum.

The deposit of pitch on the Athabasca River is very deep. It is in springs in the sides of the banks of the river. The bank at that point is not very high. A few pine trees grow at the top of the bank, and there are one or two springs there. They boil up there in the summer. You can put a long pole down 10 or 12 feet long, and you cannot find the bottom. The pitch is black and very adhesive. It is like English pitch, but it has no smell of tar. They use it at Fort McMurray to cover some of the houses, and it looks like an asphalt pavement.

I have never seen specimens of the crude oil that comes from the wells, but the general opinion is that this petroleum, or coal oil, would be found there. In fact there is a report that there are some springs of it near Edmonton. The Indians report that it exists in that country, but being superstitious they would not show where it would be found.

Discoveries of Gold, Iron and Copper; Chesterfield Inlet and Lake Athabasca.

A hill of iron on Lake Athabasca.

Mr. J. Burr Tyrrell, in the Geological Survey Reports of 1895, mentions a hill of highly hæmatitic quartzite and iron ore of 125 feet in height on the shore of Lake Athabasca, and in the Sessional Papers for the same year he reports that for 225 miles before reaching

Immense copper territory near Chesterfield Inlet.

the neighbourhood of Chesterfield Inlet and along the streams leading into it, formations are met with similar to those which are so rich in copper ore on Lake Superior, but owing to the necessity for rapid travel during the journey on which he visited this unknown country he could give them no more than hasty examination. He (Mr. Tyrrell) considers these formations a continuation of the sandstone and traps on the Coppermine River which have long been known to contain

Likely gold-bearing quartz near the Inlet.

large quantities of pure copper. Along the Doobaunt River, and on the North side of Doobaunt Lake, out-

crops of white Huronian quartzite were seen. (It is the Huronian formation that Professor Bell describes as "always apt to be metalliferous.")

It was on this journey that Mr. Tyrrell made the discovery of gold on Chesterfield Inlet.

An important discovery of gold on Chesterfield Inlet.

Petroleum fields of immense value.

From the 1888 Senate Committee's General Summary.

The evidence submitted to your Committee points to the existence in the Athabasca and Mackenzie valleys of the most extensive petroleum field in America, if not in the world. The uses of petroleum, and consequently the demand for it by all nations are increasing at such a rapid ratio, that it is probable this great petroleum field will assume an enormous value in the near future, and will rank among the chief assets comprised in the Crown Domain of the Dominion.

The greatest Petroleum field in the world.

Ironstone and Copper, West of Chesterfield Inlet.

Mr. Warburton Pike, in the account (1890) of his travels in the Barren Lands of North Canada, refers (p. 185) several times to its huge extent of ironstone country, extending North East from the Great Fish River, about lat. 65°. He also mentions coming upon Esquimaux encampments on this river and finding stone kettles and other utensils with copper let into them, shewing that the natives found this metal and knew how to work it.

Copper worked by the natives.

Section 5. Coal for visiting Steamships, Manufactures and Mining Industries.

General Summary from the Committee.

The extensive coal and lignite deposits of the lower Mackenzie, and elsewhere, will be found to be of great commercial value when the question of reducing its iron ores and the transportation of the products of this vast region have to be solved by steam sea-going or lighter river craft.

Professor MACOUN'S Evidence.

Coal on the Mackenzie.

Question:—Suppose a steamer could start from Victoria, pass through Behring Straits and the Arctic Sea to the mouth of the Mackenzie, and ascend the river to the Great Slave Lake, would that vessel have to take coal enough for the return trip, or could she depend upon the coal to be found in the Mackenzie country?

Answer:—There is no doubt at all that she could depend upon the coal of the Mackenzie, because all explorers speak of it. . . There is no doubt at all that there is excellent coal on the lower Mackenzie.

Evidence of J. B. HURLBERT, M.D., LL.D.

Plenty wood and asphaltum as fuel for steamers on Arctic Coast.

Sir John Richardson, in passing along the Arctic Coast wherever there were Rivers, found timber about the mouths of them in such quantities that, he said, if a steamer should go into the Arctic Ocean it would find wood enough to supply its daily fuel and asphaltum, or something of the kind, which is found West of the Mackenzie River, that it would find enough there to supply the daily wants of the steamer.

Extracts from the Report of Mr. WILLIAM OGILVIE, 1896.

Large seams of coal discovered.

It is now certain that coal extends along the valley of the Yukon. . . . There is a seam on it (the branch stream Chandindu) 6 feet thick. . . . On the Cornell Claim on Cliff Creek the seam is 5 feet 4 inches thick.

Coal will supersede wood for fuel in the course of a year

In the course of a year I believe coal will supersede wood for fuel which will relieve the demand as far as towns and villages are concerned; but mining interests will require a lot of fuel where coal cannot be taken.

Evidence of MALCOLM McLEOD, Q.C., Ex-Judge.

Three yards seam of coal at the junction of Mackenzie and Bear Lake River—near mouth of Mackenzie.

Question of the Committee:—You say that for a distance of 350 miles coal is indicated by abundant "shows" on the Peace River in its upper reaches and extends to the Arctic Ocean. Then you pass on to the lignite which you say is still more extensively developed.

You give the result of Sir John Richardson's observations and enquiries on the subject in this way—"At the junction of the Mackenzie and Bear Lake River the formation is best exposed; it there consists of a series of beds, the thickest of which exceed three yards, separated by layers . . . . . The coal when extracted from the bed is massive and most generally shows the woody structure distinctly."

You mentioned that all along the Mackenzie—for 1,800 miles—there are indications of this lignite and real coal.

Coal and lignite deposits along the river and on the Arctic Coast at the mouth of the river.

Has anything occurred since the publication of this pamphlet to alter your opinion?

Answer—Nothing. On the contrary, I have had information to add to it. Of late, I find from the reference of Simpson to pitch coal on the shore of the Arctic Sea, between the mouth of the Mackenzie River and Point Barrow, that the extent of the coal desposit is greater than I supposed.

Coal near the Mouth of the Mackenzie.

(See paragraph under part B, *Section* 10, *referring to Ogilvie's discovery of a large seam of excellent tested Coal on Trout River.)*

A Forerunner of Great Coal Discoveries.

"Toronto Monetary Times,"

10th September, 1897.

Prof. John Macoun, of the Geological Survey (of Canada), has returned from his summer's work on the Prairies of the North-West Territories. He states, that in Mid-August, Mr. Stafford, of the Galt Coal Company, discovered a 9-foot seam of excellent quality Coal in Alberta, six miles east of the mountains.

Coal on the Yukon.

Letter from Mr. James Hardy, in the "Sheffield Daily Telegraph" August 11th, 1897.

Sir,—I should like to say a little about these gold-fields, which I think would be of interest to the readers of your paper. As I have spent two summers and a winter up there prospecting, in the employ of Dr. Dawson, I think I ought to know something of camp life in that barren territory. The climate is bright and bracing, not damp and foggy, as Mr. Mackey says. You can work out from March until October. In the winter we opened several seams of coal, as I was a miner. They took my advice, and it found us fire and warmth in cold weather. The coal we got was lignite. We found some bituminous coal some hundreds of miles from there, but did not test it. All the coal we found outcropped on the river banks. In some places the coal was stratified; others unstratified. I think the gold at Klondike is an outcrop of some general bed. If it is so they will want miners of a better stamp when they have reef to get, instead of gravel. I would not advise any one to go from here until the spring; it would be madness to attempt it. It will be a

Climate of Alaska bright and bracing.

All the coal found, outcropped on the river banks.

grand place for men interested in coal, as it will be wanted in winter worse than gold. Young men going from here ought to get together in fours, and sixes, and so on, and not to be parted at any price. I never saw the mercury below 58 zero nor above 1·17 Fahr.

Section 6. Hydraulic and Placer Mining.

Extracts from the Report of Mr. WILLIAM OGILVIE, 1896.

Hydraulic Machinery necessary.

The only mining done on the Stewart River was on the bars in the river; the bench and bank bars were all timbered and frozen, so that to work them would entail a resort to hydraulic mining, for which there was no machinery in the country.

Splendid returns on the Stewart from a crude pumping plan

During the fall of 1886 three or four miners combined and got the owners of the "New Racket" steamboat to allow the use of her engines to work pumps for sluicing with. The boat was hauled up on a bar, her engines detached from the paddle wheels and made to drive a set of pumps manufactured on the ground which supplied water for a set of sluicing boxes. With this crude machinery, in less than a month the miners cleared 1,000 dollars each, and paid an equal amount to the owners of the boat as their share.

A rich field for pumping machinery.

There are many bank and bench bars along the river which would pay well if sluiced, but there is no convenient or economical way of getting water on to them, and there is no pumping machinery as yet in the country.

Gold in the Stewart River.

R. G. McCONNELL, 1888-89.

Extensive gravel benches of a more or less auriferous character border the Stewart River in many places, and promise remunerative returns if worked on a large scale (hydraulic machinery required).

Placer Mining in the Klondike Country.

Written for the "Engineering and Mining Journal" by its Special Correspondent, October 9th, 1897.

Special methods called for.

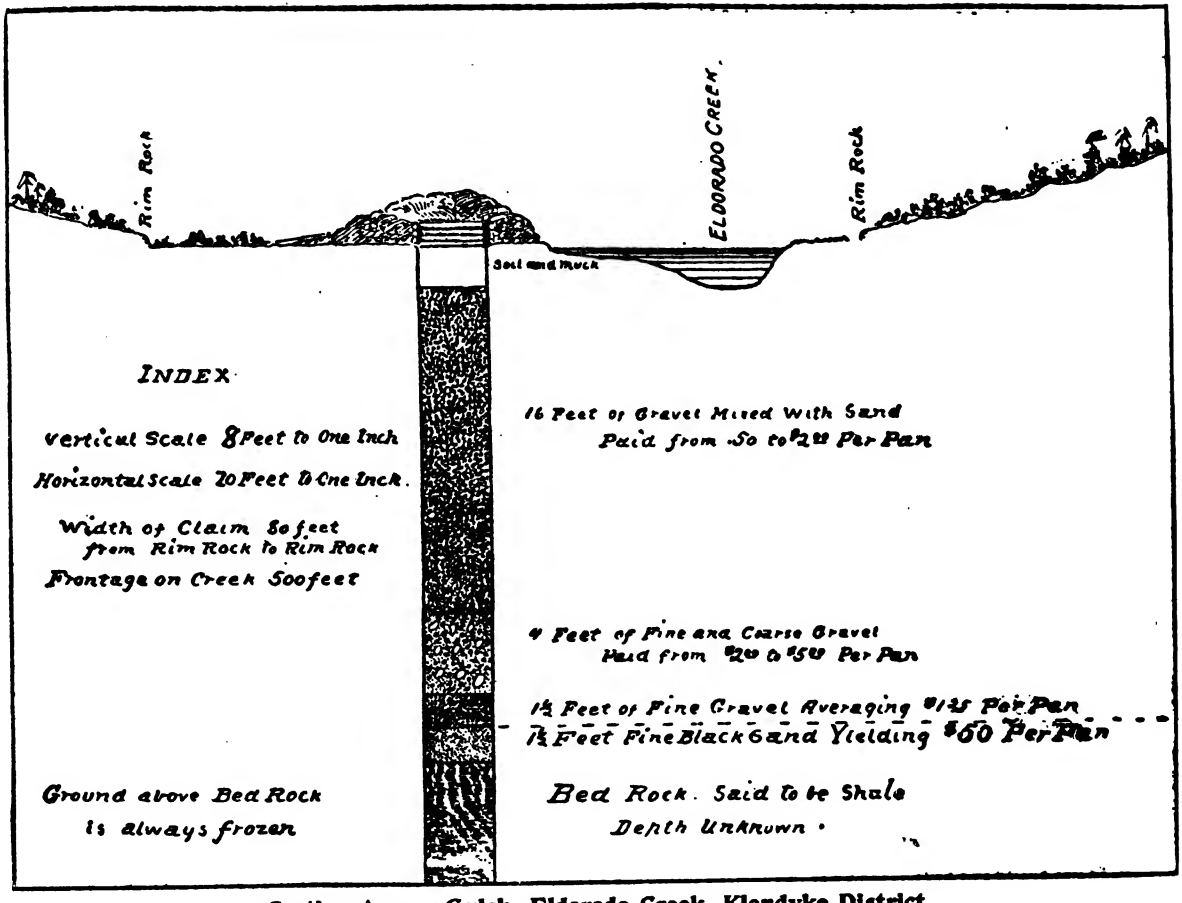
Special conditions call for special methods to meet them, and this is certainly true of placer mining in the Yukon gold belt, and more especially so in the Klondike district. With the exception of some placers in Siberia, nowhere else have men undertaken to seek for gold above the line of constantly frozen ground. The work is too arduous and forbidding, except for the short summer months when the heat is almost unbearable and the mosquitoes worse. The ground below is frozen solid down to bedrock, almost as hard and even more difficult to excavate. The frozen earth and gravel can be blasted only with great difficulty, and the only method available has been to thaw the ground by fire, as is done in the Siberian mines.

Depth to bedrock.

On El Dorado Creek, which is the richest and best known of the tributaries of Bonanza Creek, the branch of the Klondike on which the first strike was made, the bedrock on which the rich pay-streak lies is found at a depth varying from 9 feet at the mouth to 20 feet and even 28 or 30 feet higher up. The top layer, from 1 to 5 feet thick, is of muck composed of decaying vegetable matter and soil which in places is covered by long and thickly matted moss. The summer heat melts the surface where exposed to a depth of a few inches, making a very disagreeable footing. Under the muck come the several strata of gravel and sand shown in the illustration, which is a typical section across the creek. The uppermost stratum of gravel varies in thickness in places, but is quite uniform as to the amount of gold carried to the cubic foot; while those below are quite uniform on all the claims along the creek in thickness as well as in amount of gold. Under different conditions or in any other diggings but the Yukon the upper layer of gravel would be carefully worked, and most likely will be in the future even there; but so far the Klondykers have wasted but little time on it, only taking out so much as

The various strata described.

A large quantity of paying gravel thrown aside.



Section Across Gulch, Eldorado Creek, Klondyke District.

was necessary to reach the richer strata below, and in most cases not even washing out the gold from what they did handle.

How the shafts are sunk.

In sinking the shafts all the loose top stuff that can be cut and scraped away is first removed, and then a good pile of wood cut from the adjoining hills is made and set on fire. By the time this has burnt out the ground below it is thawed to a depth of several inches. Pick and shovel are then used to remove this over a space of from 8 to 12 feet square, and the shaft may be said to have been started. Alternate firing and digging in time carry it down through the muck and the thick upper layer of gravel to within some 7 or 8 feet of the bedrock.

When the shaft becomes too deep to toss the dirt out with a shovel, a windlass is rigged, and it is hoisted out by a rope and bucket, the latter generally made of a half barrel, with a rope handle passing through three holes near the top. When the poorer upper gravel has been passed the material, as far as loosened by the fire, is taken from the sides as well as at the bottom of the shaft, and the dump for sluicing is begun. This is made with an eye to the most convenient and economical way of utilizing the supply of water which is to come when the snow on the hills thaws out in the spring.

Where the nuggets come from

The work is then carried on down to bedrock, next above which, with a depth of about 18 inches, lies the rich pay-streak. From this and the cracks and rifts in the shale rock underneath come most of the nuggets. This stuff is laid by itself on the dump and given special care in washing, as it abounds in dust and flaxseed gold as well as nuggets. Many men have been satisfied with one season's work on this rich deposit.

On all the deeper claims, after reaching bedrock only the pay-streak and the two strata above it are followed by drifting. The method is the same as in the vertical shaft, wood being piled at the end of the drift and burned to thaw out the ground. While more men can find room to

work the progress made is comparatively slow, as for lack of draught the fire burns slowly and the smoke takes a longer time to clear out of the way, so as to allow the men to get at the work of digging and hoisting out. In thus going down to bedrock and then drifting on only the richest strata, the readiest and largest returns are secured for the time and labour expended.

Difficulty in melting the frozen gravel.

This was the first object with the poorer Klondikers, to take the richest, make their pile and get out of the country, leaving the other stuff to be worked by those who came after them, as it all will be when improved conditions as to labour, supplies and proper machinery exist. So far it has not been found necessary to leave pillars or put in supports for the roof of the drift. So firmly is the material frozen that it is as hard and strong as the bedrock below.

Stuff thrown aside by the poorer Klondykers will all be washed over again.

From rim-rock to rim-rock the El Dorado Creek bottom varies from 80 to 500 feet in width, and, as far as ascertained, the deposits are quite uniform over the whole with a length of about eight miles. The amount of gold yet to be handled on this creek alone must be very large.

Width of bottom of gold-bearing creeks.

A large number of the nuggets taken out of this creek have had quartz imbedded in the metal, showing their original home to be not far distant, but as yet no definite location has been made of any quartz ledges. As a matter of fact, few have turned their attention in that direction; the heavy covering of thick, matted moss that lies on the hills hides the rocks from sight, and makes prospecting extremely difficult. The more certain returns from the creek bottoms have so far been the more attractive to the miners.

Quartz in the nuggets show the nearness of quartz reefs.

Although much has been written in regard to the erosion of these valleys, and the deposit of the gold by the action of glaciers, an inspection of a large quantity of nuggets from the several branches of the Klondike seem to show that they have never been subjected to the squeezing and grinding forces in

Gold displaced from quartz ledges by action of water, not glaciers.

evidence on the terminal moraines to be found along any glaciers. They rather show proof of gradual and gentle loosening from the original rock and of the after action of water, and that only to a limited degree.

Prospecting with "Rocker" and Pan.

First steps of a prospecting miner with the pan.

When a miner "prospects" he washes a few panfuls of gravel or sand, and according to the number of specks of gold he sees in his pan after the dirt has been washed out he estimates the richness of it. The "rocker," which the miner uses in placer mining, is a box about three feet long and two feet wide, made in two parts, the top part being shallow, with a heavy sheet-iron bottom which is punched full of quarter-inch holes. The other part of the box is fitted with an inclined shelf about midway in its depth, which is six or eight inches lower at its lower end than at its upper. Over this is placed a piece of heavy woollen blanket. The whole is then mounted on rockers and set in a convenient place near a good supply of water. The miner puts the gravel and sand he has collected into the shallow box on the top, and he rocks it gently while he ladles in water. The finer matter with the gold falls through the holes on to the blanket, which checks its progress and holds the fine particles of gold. The sand passes over it to the bottom of the box. Across the bottom of the box are fixed thin slats, behind which some mercury is placed to catch particles of gold which may have escaped the blanket. Of course if there are any nuggets they are retained in the upper box. By sluicing, however, about three times as much dirt can be washed as by the rocker, and consequently sluicing is always the process employed when a good fall of water can be obtained. In Alaska many miners spend the winter in thawing the ground and collecting the dirt, which they heap in a pile till summer comes and water can be obtained.

Next step—the "rocker" or "cradle."

Description of the "rocker."

Sluicing.

Section 7. Furs, Ivory, &c.

General Summary from the Committee.

The chief present commercial product of the country is its furs, which, as the region in question is the last great fur preserve of the world, are of very great present and prospective value, all the finer furs of commerce being there found, and the sales in London yearly amounting to several millions of dollars.

The great fur preserve of the world.

Evidence of the Rev. E. PETITOT.

On the sea coast and the right bank (of the Mackenzie River), the Esquimaux have told me that there are caves containing fossilized bones of large antediluvian animals, particularly of the mastodon, of which they have shown me pieces of tusks of the finest ivory.

Caves containing fossilized bones and ivory of the Mastodon.

Evidence of DONALD McIVOR.

Animals in Mackenzie Basin are:—red-deer, reindeer, cabre, musk ox (robes very valuable), moose, elk, wild sheep and goats, lynx, Arctic fox, black fox (skins worth from £6 to £8 each), silver fox (skins nearly as valuable), cross fox, wolverine, otter, beaver, martin, mink, ermine, trout, pike, salmon, in fact, nearly every kind most numerous.

Animals in Mackenzie Basin.

Fish.

Furs of the N.W. Territories; 1888 Committee's Report.

The Committee have found a great deal of difficulty in getting information regarding the quantity of furs exported from the N. W. Territories. The following is incomplete, but is all the Committee could obtain.

Quantity of furs offered for sale in London at the Annual Auction Sale by the Hudson Bay Co., and C. M. Lampson & Co., in the year 1887.

Sales in London of some of the furs exported from the N. W. Territories.

Otter	14,439
Sea Otter	3,868
Fisher	7,192
Fox, Silver	1,967
Fox, Cross	6,785

Fox, Red	85,022
Fox, White	10,257
Fox, Blue	1,440
Fox, Kitt	290
Lynx	14,520
Skunk	632,794
Marten...	98,342
Mink	376,223
Beaver...	104,279
Musquash	2,485,368
Extra Black Musquash	13,944
Wolf	7,156
Wolverine	1,581
Bear (all kinds)	15,942
Musk Ox	198
Badger...	3,739
Ermine	4,116
Swan...	57
Rabbit (American	114,824
Hair Seal (dry)	13,478
Sable	3,517
Fox, Grey	31,597

Evidence of Mr. JAMES ANDERSON and his father, the explorer (1888 Committee).

Fur and Food Animals in the Far North.

The furs of the Mackenzie River are those of the beaver, marten, silver fox, lynx, otter, cross fox, blue fox, red fox, musquash (muskrat), mink, bears, wolves, and wolverines. The food animals amongst these are the beaver and bear. Towards the Arctic Ocean are found the musk ox, and the reindeer, and all the fur-bearing animals are found along the coast.

The food animals on the Mackenzie River are the moose, rabbit, wood partridge, white partridge geese of all kinds, cranes, waveys, and ducks of all kinds.

Large and Exceptionally Fine Specimens of Ivory found.

"Pall Mall Gazette," 9th October, 1897 (from the Special Correspondent).

As confirming what was said in a previous letter, Mr. Wilkinson, of Nanaimo, B. C., who returned from

the Klondike some time ago with 40,000 dollars, the result of but three months' labour, says that large and exceptionally fine specimens of ivory were found last season solidly embedded in the ice gravel. Tusks of mastodons, weighing as much as 150 lbs., were found in an excellent state of preservation. While working his claim, Wilkinson found a leg bone of a mastodon covered with flesh. He remarks that there are indications on every hand to show that Alaska was once a tropical country, and rank tropical vegetation is seen preserved in ice.

But it is nuggets, and not mastodons, that the miners want.

An Alaskan Plain Strewn with Ivory Tusks.

The Sheffield "Daily Telegraph," August 21st, 1897.

Klondyke the home of ivory as well as gold, says the *Pall Mall Gazette*.

Klondyke seems to be the home of ivory as well as of gold, according to the *Pall Mall Gazette*. "It was quite the result of accident," it says, "that what may be called the last home of the mammoths—for we can hardly credit the Indian tales of live specimens—became known to a white man. The Redskins of Kwaquihuilette, a village on the Yukon River, have long known of the spot, but of the value of the ivory they have been totally ignorant. They are silent men, those Redskins, except when the liquor is in them; and it required long residence among them before a miner, by name of George Hughes, heard of the treasure-trove and its whereabouts. Illness kept this man a prisoner at Kwaquihuilette a year or two ago. As he recovered he began to learn many of the Indian ways, and partially mastered the language of the particular tribe he was with. His attention was attracted to the ivory ornaments the natives wore; and he noticed that even their rude dining articles were made of the same material. He induced the Indians to show him the place whence came this ivory. It took several days hard sleighing to reach the spot. But the work

A plain . . . scattered everywhere were tusks white and gleaming with frost.

was worth the reward. The miner saw what no white man had ever before witnessed. There, on this plain, frozen to the ground, were hundreds and hundreds of skeletons of gigantic beasts, and scattered everywhere were tusks white and gleaming with frost. This was undoubtedly a graveyard of mammoths, and the miner's fancy pictured it also as a battlefield, for in some instances the tusks of one animal were found buried in the skeleton of another."

Section 8. Steam Navigation from Vancouver via Behring Straits to Mackenzie Bay and through to Mackenzie River.

General Summary of the 1888 Senate Committee.

Navigation from Behring Straits to Mouth of the Mackenzie open for three months every year.

A reference to the valuable evidence obtained by your Committee will show that navigation from Behring Straits to the mouth of the Mackenzie River, and probably as far East as Wollaston Land, may be had for *three months in each year*, the soundings given on the Admiralty Chart of that portion of the Arctic Sea revealing an average depth of about 20 fathoms. The western branch of the estuary of the Mackenzie is said to be the outlet which has the deepest waters. . . .

That with suitable steam crafts this river (the Mackenzie) and lake navigation may be connected with Victoria and Vancouver by way of the mouth of the Mackenzie, the Arctic Ocean and Behring Straits and Sea. (It is now connected on the south by 90 miles of waggon road between Athabasca Landing and Edmonton, with navigable water in the Saskatchewan River.)

Evidence of W. C. BOMPAS, D.D., Bishop of Athabasca.

Opening up the Mackenzie by steam from the Arctic Ocean.

Regarding the object of placing steam on the Mackenzie . . . . it becomes a question how far it is consistent with the national honor and the glory of Her Majesty and the British Empire to allow this magnificent stream to be navigated by only a few barges, when in the neigbouring territory of the United States most inconsiderable streams are traversed by steamers.

The Mackenzie is navigable for steamers for about 1,300 miles from its mouth, and the channels at its mouth have been correctly laid down on the Admiralty Charts.

Mr. Gordon Bennett exploring the mouth of the Mackenzie.

It is said that Mr. Gordon Bennett of New York has sent his vessel to explore the Mouth of the Mackenzie, and its seems a pity that British vessels should be wholly absent from that region.

Evidence of J. B. HURLBERT, M.D., LL.D.

The Arctic Ocean passage no new thing.

The American whalers made voyages every year to the Arctic Ocean off Mackenzie River a quarter of a century ago. Dr. Richardson inferred there was an open sea from the whales in great numbers being in the sea, as they must come constantly to the surface to breathe.

Captain Collinson was 50 miles off the Mackenzie River.

Open water in Mackenzie Bay for five months in the year.

There is plenty of open water at the mouth of the Mackenzie River for five months in the year.

Evidence of DONALD McIVOR.

Mackenzie open.

The average length of open water (in the Mackenzie River) is from second week in May to first or second week in October.

From three to four months' fishing at the mouth.

Excellent harbours (mouth of Mackenzie) and think whaling or sealing vessels would have at least three to four months' fishing without being impeded by ice.

General Summary from the Committee.

Though the Arctic coast line has been explored the territory inland has never been scientifically explored.

Arctic explorers had indeed traversed its (the N.W. Territory) coast line and descended two of the rivers, which, east of the Mackenzie, flow into the Arctic Sea, but the object sought by them was one which had no relation to that of the present enquiry, and it is only incidentally that their records are now valuable. The knowledge of missionaries and the officers of the Hudson's Bay Company is chiefly to the water courses and the great lakes, while scientific exploration has not as yet extended north of Great Slave Lake.

REPORT

By the Hon. John Schultz, *Lieut. Governor of Manitoba, upon Whaling in Mackenzie Bay, and the Passage from Behring Straits to the Mouth of the Mackenzie River.*

Government House,

Winnipeg, *3rd August*, 1894.

Open water to Mackenzie Bay for 3 months every summer.

There is open water from Point Barrow to Cape Bathurst for quite three months in the summer. . . . The Eskimo at the mouth of the river (Mackenzie) killed over 50 of the white whale last summer; in fact the catch of whales last year by the whalers seems to have been phenomenal. Two of the vessels captured over 50 each (an average whale is worth £1,000 in oil and bone), which yielded an average of 1,800 lbs. of whale bone per head (quantity of oil not mentioned), which would mean an immense profit to someone. I understand that only the bone is taken, so that the oil is nearly all wasted.

American Whalers already visiting Mackenzie Bay.

Seven vessels wintered at Herchel Island (in Mackenzie Bay), and more are expected this year. I am afraid that a great deal of liquor finds its way amongst the poor Eskimo. I do not know that English or Canadian whalers would treat the Eskimo any better

than the Americans do, but it does seem a shame that so many hundreds of thousands of dollars should be pocketed by the Americans every year and not a cent. by the Canadian or British.

The only Navigable Channel: a safe Harbour.

Other evidence from a High Authority.

Mr. ——— states that many mouths from the Mackenzie River meet the Arctic Ocean coast line in the 40 miles across from land to land, the delta being composed of so many cross channels as to produce almost numberless low lying islands. All these channels save the one sounded by . . . . and himself are shallow and tortuous and the one in which he says they never found less than two-and-a-half fathoms throughout is close to the east side of the delta, and its navigability has been kept a secret by . . . . and himself in pursuance of a laudable design to prevent the entrance of their boats or the ships in question, more especially as within the mouth of this branch of the delta is to be found a secure harbour. . . Several attempts have been made by boats from the wintering ships to ascend the river, but as all their efforts were confined to the West side of the delta they met with no success, and, indeed, since Sir Alex. Mackenzie's time, and the boat expeditions of Sir John Franklin and Dease and Simpson, there seems to have been a gradual filling up of these Western channel.

Only one deep channel through the delta of the Mackenzie—and that one a secret.

A secure harbour within the secret channel.

From the Hon. J. SCHULTZ, Winnipeg, 4th January, 1895.

Now that cordial relations have been established in some measure, at least, between our northern inland natives and the Eskimo, Herchel Island may be reached from the head of the estuary of the Mackenzie, where Peel River joins it, in safety, and with comparatively little difficulty if proper voyageurs be chosen and the start is made at a proper season . . . the only communication (between Mackenzie Bay and the River), as you are aware, is by the annual trips of the Hudson's Bay Company's small Mackenzie River steamer "Wrigley."

Herchel Island, in Mackenzie Bay, the whalers' present harbour, easily reached from the Peel river.

Section 9. Whaling and Sealing off the Mouth of Mackenzie River; Splendid prospects.

Evidence of GEO. M. DAWSON, M.D., LL.D., Geological Survey of Canada.

Whaling at the mouth of the Mackenzie.

The idea I ventured to suggest was that whaling stations be established east of the region usually reached by whalers (near mouth of Mackenzie River), which would enable whaling and sealing to be carried on in a way that it could not be by vessels going and returning the same season, and remaining to catch whales and seals in those northern waters.

Value of the whaling industry.

To show the extent and value of the whaling industry in Behring Sea, and in the Arctic ocean to the north—entered through Behring Straits, which has always been considered an open route by everybody—I may give the following figures:—In 1880, there were 36 sailing craft, and 4 steamers. They produced—

35,000 lbs. of whalebone, valued at 850,000 dollars.
15,000 ,, of ivory, ,, 9,000 ,,
21,000 barrels of oil, ,, 280,000 ,,
= an average of £5,700 per vessel, per year.

Evidence of J. B. HURLBERT, M.D., LL.D.

The Arctic Ocean quite open in Summer.

In 1837 Thomas Simpson, on his return from a voyage from the Mackenzie through the Arctic Ocean to Pt. Barrow, stated:—"The sea was clear and navigable by ships during the summer months. Reindeer, Arctic foxes, and seals were numerous. Many whales and seals were seen everywhere. The natives met with were well provided with whalebone and sealskins. They were well clothed in seal and reindeer skins."

Seals, whales, foxes and reindeer in large numbers.

. . .

Evidence of DONALD McIVOR.

Whales, seal, &c.

Whale, seal, walrus are to be found in large numbers in and about Mackenzie Bay.

Great tracts of valuable timbers along the Mackenzie —chiefly pine, spruce, tamarac, poplar and birch.

General Summary of the 1888 Committee.

. . . . . The following (fish) have been found on the Northern . . . . coast within the scope of the present enquiry, viz.:—Salmon. The capeling is found on the coast of the Arctic Ocean . . . . thus implying the presence of cod upon banks near by, and the rock cod has been frequently taken. The Greenland, or harp seal and the grey square flipper seal . . . . are all found with the walrus and porpoise off the mouths and in the estuary of the Mackenzie River. Fish.

The seas adjoining the great territory which your Committee has had under investigation are frequented by whales of different species, walruses, narwhals, and a variety of seals. All these animals are valuable for their oil, but the large species of whales have heretofore been most sought for. Only a few years ago these animals had a much more extensive range than at the present time. Owing to improvements in navigation and methods of capture, they have, of late years, fallen an easier prey to their pursuers and have taken shelter in the less frequented seas of the northern coast of Canada. Whales, seals, and walruses in large numbers off the northern coast of Canada.

Extracts from letters from Dr. REEVES, Bishop Mackenzie River District, to the Hon. JOHN SCHULTZ.

GOVERNMENT HOUSE,

WINNIPEG, 18*th Sept.*, 1895.

Mr. Hodgson is here (Selkirk) on furlough to pass this winter with his aged parents from whom he had been separated for many years, having spent twenty-one years in the Mackenzie River District, and was latterly and for some years in charge of Fort Macpherson, Peel River. Mr. Hodgson's knowledge of the mouth of the Mackenzie River.

Whaling ships winter every year in Mackenzie Bay

In immediate reference to the subject of my letter of the 3rd ult., he says that four whaling ships wintered last winter at Herchel Island harbour, seven ships the winter before, four ships on the previous winter, and four ships before that again, bearing out the accuracy of information supplied to me and by me transmitted to you for the past several years.

The importance of Mackenzie Bay as a whaling harbour.

Their principal reason for availing themselves of this most important Arctic Harbour is, as I before stated, because of its nearness to their principal whaling ground, whence they can proceed to their lucrative business a long time before these grounds can be reached from Behring Straits (in time to catch the opening of the season) and from the fact that the spring rush of water down the Mackenzie River clears a large area near its various mouths long after the shore ice is firm far to the East and West.

Mackenzie Bay clear of ice long before the seas along the coast are clear.

The whalers visiting Mackenzie Bay trade goods with Eskimo and hunters in exchange for furs.

They do not, therefore, go there specially to trade with the Eskimo, but this being their only profitable occupation in Winter and very early Spring, they get large numbers of common and valuable fox skins and supply the Eskimo with goods in trade, even up to the vicinity and at the Peel River Fort (MacPherson), take beaver and other furs from the legitimate traders of that region.

Valuable Ivory Deposits.

From the Hon. J. SCHULTZ, Winnepeg, 4th January, 1895.

Results from whaling in Mackenzie Bay enormously lucrative.

Since then (date of last letter) at least one of the ships, which, in the winter of 1893-94 wintered at Herchel Island had reached San Francisco and although I have no more definite account of the value of the cargo sold by her owners at that point than the west coast newspapers give, it would seem that the trade in which she was engaged has been enormously lucrative, and should the vague Eskimo reports of prehistoric ice and mud-embedded deposits of ivory similar to such on the Siberian coast, and that, I believe, of Alaska also, have any foundation other than mere rumour, these profits might be, in the future, very

Great stores of ivory.

much enhanced indeed, and add to the regret that foreign vessels should have so complete a monopoly over a Canadian trade apparently so profitable, which is carried on indeed in violation of several statutory enactments and departmental regulations. (*See* reports of ivory confirmed in accompanying evidence.)

Whaling, &c., Statistics (Hon. J. SCHULTZ).

1887 — Total catch by San Francisco whalers amounted to 2,000,000 dollars. **Rich returns from whaling expeditions.**

1888—San Francisco fleet operating in the Behring Sea and Arctic Ocean :—25 vessels, including tenders, landed products to the value of 627,345 dollars; average value of each vessel, 25,094 dollars. Eight of these were steamers—of a tonnage ranging from 250 to 860 tons for each vessel—average value landed from these steamers was 45,320 dollars (£9,441). Nearly the whole of the whaling at the mouth of the Mackenzie is done by the steamers. Six of these vessels also landed 90 fox, 48 lynx, 2 bear, and 10 other skins, 6,000 lbs. walrus hides, and 1,310 lbs. walrus ivory.

1889—Twenty-three vessels, including tender, landed products to the value of 358,935 dollars; average value to each vessel, 15,606 dollars . . . . . there were seven steamers, average value of products landed, 31,173 dollars.

Each whale is worth 5,000 dollars, when both oil and bone are utilized. **Enormous value of each whale.**

. . . Our North coast whale fisheries are extremely valuable in the eyes of the Americans, for no others operate there . . . **The only whalers in the Arctic are the Americans.**

The fishing season of the Arctic is usually from about the first of May to the first of October . . . . **Date of opening of whaling season.**

The vessels cruise South of Behring Strait until the ice breaks up sufficiently for them to force their way through the Strait into the Arctic Ocean. This is generally about the first to the middle of June. The whalers enter the Arctic about the first of the month.

Whales concentrate in Mackenzie Bay.

When the whales enter the Arctic they follow up the American shore into the North East as fast as the ice breaks up. They go, nobody knows where, but it is surmised into the great basin at the mouth of the Mackenzie River.

Report of Inspector C. CONSTANTINE, Commandant of Yukon District, 20th November, 1896.

Government attention directed to the territory at the mouth of the Mackenzie River.

The territory about the mouth of the Mackenzie River and Herschel Island is one that the attention of the Government is called to. Twelve whalers, steam and sailing, wintered there last winter. . . . . .

Men deserting Mackenzie Bay whalers for the Klondike diggings.

Many men desert from the whalers each season and having heard of the rich placer mines of the Yukon, make their way there. . . . . These men come across country (from Mackenzie Bay) to Rampart House, on the Porcupine River, a distance of ten days' travel over a rolling country, and, for this territory, fairly easy travelling, thence down the Porcupine River to Fort Yukon, and from there up the river (the Yukon).

Short journey and easy travelling from Mackenzie Bay to the Yukon River.

One of these men by some means got word to the vessels, giving an account of the country here (Klondike), which induced a number more to leave, and many wished to, but were unable for various reasons. In some instances, where men had succeeded in getting away for some distance, they were overtaken by the ship's officers, and stripped of all they had, hoping they would then return.

Herschel Island in Mackenzie Bay

Herschel Island is in the Yukon (Police Administration) district. . . . . Pearl Cove is the harbour on the south side . . . . . about 80 miles from west mouth of the Mackenzie. The easterly mouth of the river is the main one, about 130 miles from the island.

The ice at the island breaks up about the end of May . . . . . and begins to form about 1st of September each year.

Ice at Herschel Island in Mackenzie Bay

Whaling profits and particulars.

"The Morning Mercury," New Bedford, Mass.,
14th October, 1897.

It was in 1848 that the first whaleship passed through Behring Straits, and since that time the Arctic Ocean has been the principal field for the hunters of oil and bone.

The first whaling steamer through Behring Straits.

The first steam vessel to engage in the whaling business was the "Mary and Helen," built by Captain Wm. Lewes in 1880. During her first voyage this vessel captured a cargo of oil and bone valued at 100,000 dollars. She was sold to the United States Government and re-named the "Rogers," and sent in search of the ill-fated exploring steamer "Jeanette."

The first steam-whaler; a great catch.

Presumably the most remarkable whaling voyage ever made in the old days, so far as profit is concerned, was that of the "Envoy," which sailed from New Bedford in 1848. She returned to Providence in 1847 from a whaling voyage and was there condemned and sold to Wm. O. Brownell of New Bedford to be broken up. Mr. Brownell, however, concluded to fit her for another voyage, and did so, sending her to sea under the command of Captain W. T. Walker. Such was the condition of the vessel that the underwriters declined to insure her. The net profit of the voyage was 188,450 dollars. The "Envoy" was fitted at an expense of about 8,000 dollars.

The most remarkable whaling voyage made in the old days.

Whaling in the Arctic Ocean via Mackenzie River.

. . . .

Evidence of the Hon. Wm. CHRISTIE, late Inspecting Chief Factor of the Hudson Bay Co., to 1888 Committee.

Mackenzie Bay free of Ice for several months

As to whether whaling or sealing craft if built at the headwaters of the Mackenzie River could descend to coast early enough, and ascend the river late enough to permit of some months' fishing near the mouth of the river, I would say, yes. I do not think there would be any difficulty in building craft at the head of the Mackenzie to descend to the mouth of the river, remain there for some time, and return the same year, because, etc. . . .

Section 10. Navigability, &c., of the Country's Seas, Rivers, and Lakes.

General Summary from the 1888 Committee.

Great extent of unbroken navigation.

In referring again to the navigation of this region, all the evidence has agreed to the great extent of unbroken navigation (from the mouth of the Mackenzie River).

The Peel River a gold-bearing stream.

The steamer "Wrigley," of the Hudson's Bay Company, distributes stores (to the Company's various fur collecting posts) down to the mouth of the Mackenzie, just above the estuary, where the river is said to be six miles wide, and up the Peel River, which joins the Mackenzie near that point to Fort Macpherson, on that gold-bearing stream.

Evidence of Hon. WILLIAM CHRISTIE, ex-member of the N.W Council, late Inspecting Chief Factor of the Hudson Bay Co.

Distances of Navigable Waters.

"The Hudson Bay Co. have now a steamer on the Mackenzie River, which last year (1887) ran from Fort Simpson to the sea, and down the Peel River." The distances on the Mackenzie River and Lakes to the mouth—

100 miles (say) down Slave River from Fort Smith where there are impassable rapids, to Gt. Slave Lake.

250 miles across Gt. Slave Lake to Head of Mackenzie, that is, Big Island or Fort Providence.

203 miles from Head of Mackenzie, *i.e.*, Fort Providence, to Fort Simpson.

271 „ „ Fort Simpson to Fort Norman.

434 „ „ Fort Norman to Port Separation.

129 „ „ Port Separation to the sea.

1,387 miles, total distance navigable for light draught steamers from Fort Smith on Slave River to Mouth of Mackenzie.

Evidence of Right Rev. ISIDORE CLUT, Bishop of Arendale.

Navigable Rivers in the Mackenzie Basin.

The Mackenzie is the finest river in the world for its length, its depth, and its size in summer. Steamers leaving Fort Smith cross the Great Slave Lake, and can descend as far as the Arctic Ocean.

They can also ascend the Peel River.

Evidence of GEO. W. DAWSON, LL.D.

The Mackenzie and Yukon rivers interlocked by streams.

It is a little difficult to separate the basin of the Mackenzie from the waters of the Yukon when you get west of the mountains, because these rivers interlock with each other in all directions. . . . In passing through the country last summer I formed the opinion that a large portion of that country would be eventually settled.

The Yukon-Mackenzie country will be eventually settled.

Evidence of WILLIAM J. McLEAN, Chief Trader of the Hudson Bay Co.

Mackenzie navigable by sea-going steamers.

I cannot speak of depth of water at the mouth of Mackenzie River, but believe that sea-going steamers would ascend its whole length.

Evidence of DONALD McIVOR.

Wooded banks and excellent harbours.

The Mackenzie is extensively wooded on the banks, has excellent harbours, and would be navigable for five months the in year by steamers of ordinary size.

"Financial Times," July 30th, 1897.

The Porcupine River navigable.

"By the treaty of Washington of 1871, the Yukon, the Porcupine (flowing into it from the east) and the Stikine were internationalised for navigation purposes at the suggestion of Sir Donald Smith, the present Canadian High Commissioner."

A

Distance between Mackenzie and Yukon Rivers.

R. G. McCONNELL, 1888-89.

A cart-trail between the Yukon and the Mackenzie.

The navigable waters of the Mackenzie are separated from those on the Yukon in lat. 67° 20 N. by a distance of about 60 miles only. A cart trail was staked out some years ago by the Hudson's Bay Company across the interval separating these rivers, with the intention of supplying the Mackenzie River district with goods by way of the Yukon River; but the project fell through, and the road was never built.

The Mackenzie River and Tributaries.

WM. OGILVIE, 1887-88.

The Mackenzie River 11 feet in depth.

Capt. Bell, of the steamer "Wrigley," stated that the shallowest water found by him in any part of the Mackenzie was 11 feet.

Important unexplored Tributories of the Mackenzie River.

From all the evidence I (Ogilvie) could gather vessels drawing from 8 to 10 feet of water would find no difficulty in navigation as far as Great Slave Lake. A

short distance above the Ramparts (near Fort Good Hope) a river flows into the Mackenzie from the west. It appeared to be 200 yards wide at its mouth. All I could learn about it at the Fort was that it came from far up in the mountains.

6½ miles above Sans Sault Rapids and 328 miles from Fort Macpherson, on the Mackenzie, Carcagou River comes in from the west. It is a large river, being not less than 400 yards wide at its mouth.

An Indian with me (Ogilvie) stated that this stream was very large and very long, the Indians having ascended it for great distances through the mountains. A river which it might prove advantageous to explore.

It appeared to run parallel to the Mackenzie for some distance, then, turning sharply to the west, to enter the mountains. This river seems to be the largest tributary of the Mackenzie below the Liard.

G. M. DAWSON, 1887.

The Mackenzie drains an area of 677,400 square miles.

See Section 11 *for distances.*

B

The Porcupine, Rat and Bell Rivers.

Extracts from the Report of Mr. WILLIAM OGILVIE, 1887-88.

Writing of the excellence of his two Peterborough Canoes, Mr. Ogilvie writes :—

In the Spring of 1888, they (the Canoes) descended the latter river (the Porcupine) . . . . to the mouth of Bell's River, and up it to McDougall's Pass. They were then carried over the Pass to Poplar River, and were used in going down the latter to the Peel River, and thence up Mackenzie River, 1,400 miles. Journey from the Porcupine to the mouth of the Mackenzie River.

R. G. McCONNELL, 1887.

The Rat River for some miles from the Peel River winds through a flat alluvial plain then enters a lake Rat River.

region as the current is uniform and easy. After this the mountains are reached.

The Head-waters of the Porcupine river only 30 miles from the Yukon.

The Porcupine River rises only 30 miles from the Yukon, describes a great curve and joins the Yukon 150 miles further down. At its most easterly point it approaches within 30 miles of the Mackenzie (and naturally much nearer the Peel River). Its length is 500 miles.

The Bell River.

The Bell River is through alluvial and quartzite country. Its upper part has not been explored. At the Fort (La Pierre's House) it is a small, sluggish stream, of 40 to 50 yards wide; banks low, and alluvial with wooded banks. Its length from La Pierre's House to the Porcupine is about 30 miles, with no rapids and navigable throughout.

From the mouth of the Mackenzie River to the Yukon.

The Indians take seven days to do the heavy portage-boats, &c., from Fort Macpherson to La Pierre's House—exactly 50 miles. (This is the cross-country, portage. By way of the McDonald Pass the journey can be done almost the whole way by the waters of the Rat and Bell Rivers and a lake in the Pass).

Evidence of the Hon. WM. CHRISTIE, late Inspecting Chief Factor of the Hudson Bay Co.

Short route across from the mouth of the Mackenzie to the Porcupine.

For the trade on the Yukon we (the Hudson Bay Co.) used to take the goods down the Mackenzie and across the mountains to the Porcupine, thence down the Yukon. It is only a short distance across from the waters of the Mackenzie River. Peel's River (Fort Macpherson) is the lowest post on the Mackenzie (near the mouth).

See Section 11 *for distances.*

R. G. McCONNELL, 1888-89.

Arctic Region rivers navigable from 3 to 4 months each year.

The Rat and Porcupine (which includes the Bell) Rivers could easily be navigated for three or four months of the year by small steamers from La Pierre House down to the junction of the Porcupine and Yukon Rivers.

R. G. McCONNELL, 1888-89.

This river—the Porcupine—rises within 30 miles of the Pelly-Yukon River, Lat. 65° 30′ N., and after describing a huge curve of about 500 miles joins the Yukon about 150 miles further down from the point nearest its head waters.

The Porcupine rises only 30 miles from the Yukon.

From the Bell River to the Yukon short ripples are met with . . . but no rapids or other obstructions which would prevent the navigation of the stream by small steamers.

The distance, by river, from La Pierre's House to Fort Yukon, where the Porcupine joins the Yukon, is 290 miles.

See Section 11 *for distances.*

Bell and Rat Rivers, and McDougal's Pass.

WM. OGILVIE, 1887-88.

About five miles above La Pierre's House, in an air line, but much more than that by the river, the Rat River joins from the East (this river flows into the Peel) . . . . the country around abounds with game.

A country abounding with game.

There are two routes—one for winter, and the other for summer travel—between La Pierre's House on the Bell River, and Fort Macpherson on the Peel. The distance between is said to be nearly 80 miles, and is done in three days. All the trading outfit for La Pierre's and Rampart House (on the Lower Porcupine) has to be brought this way in the winter months on dog sleighs, and the furs and meat received for it has to be taken to Fort Macpherson in the same way. From there the furs are sent out by the Mackenzie River. Shallow draught steamers drawing not more than 2 feet 8 inches can navigate any place in the Bell and Porcupine Rivers.

An old route still used from the mouth of the Mackenzie to the Yukon.

By the Summer Route viâ McDougall's Pass the Bell River is navigable 21 miles (Ogilvie did this journey by water as early as 8th June).

McDougall's Pass.

A shallow creek about 8 miles in length takes one to the Pass, which is four miles across. Lakes on the top, when open, reduce this portage distance to less than half a mile. A creek, 3½ miles long, on the other side takes one to Trout River—thence to the Peel.

The Pass is wide and level, the valley being nearly a mile wide at the bottom and very flat. It is almost treeless.

The distance from Bell River to Trout River by this route is about 14½ miles.

The summit of the Pass is only 1,200 feet above sea level and not more than 200 feet above the level of Bell River.

Asbestos.

There are several veins of asbestos at the foot of the slope on the south side of the Trout River about four miles from the Pass.

A large seam of good coal.

10½ miles down the river I saw (quoting Ogilvie), what seemed to be a 3-feet seam of coal in the face of the cliff on the river edge. It extended a quarter of a mile along the whole length of the cliff. Mr. McDougall told me that he had found the same seam, and had taken some of the coal to Fort Simpson, where it was tried and found to be a fair quality of coal.

Game in abundance

Mountain goats, big horn sheep, cariboo, and moose, abound in the hills around the Pass.

A good roadway possible.

From the Pass to slack water in the level ground at the foot of the hills, is a distance of 24 miles by the Trout River. A roadway with a gradient of 55 feet to the mile might be made, reducing this distance to 20 miles. Such a road was projected by Mr. McDougall.

Trout River is called—locally—Poplar River from the foot of the hills to Peel River.

Fort McPherson is on the right bank of Peel River, some 14 miles above the point where it divides and joins the Mackenzie delta. The river at the fort is about half a mile wide. The growth of timber (in the district), is, for the latitude, very large and thick, many spruce from 12 to 15 inches diameter occurring along the Peel River, and along the Mackenzie for some miles up.

Plenty of large thick timber near the mouth of the Mackenzie.

(*See Section* 11 *for distances*).

C

The Peel River.

(*See Section* 11 *for distances.*)

Extracts from the Report by R. G. McCONNELL, B.A., 1887.

The Peel River winds through a low alluvial country for thirty miles from Fort MacPherson then enters the mountains and is 300 miles long.

R. G. McCONNELL, 1888-89.

Of the other tributaries of the Mackenzie, Peel River is the only one that can be considered navigable. This is ascended annually by the steamer *Wrigley* as far as Fort Macpherson a distance of about 30 miles, and if necessary could be followed much farther, but the exact distance is not known.

A very important navigable tributary of the Mackenzie.

W. A. K. ISBITER'S Journey down the Peel River, 1844.

Isbiter, an employé of the Hudson's Bay Company, made a boat journey down the Peel in the year 1844, from Fort Macpherson. Some distance up the river he abandoned his boats owing to the difficulty experienced in making way against the swift stream with his small party and large cumbersome boats. He took to canoes which further up he also abandoned owing to the increasing swiftness of the current. He mentions no serious impediments to steamer navigation of this river and gives its approximate length at 300 miles.

The only exploration of the Peel River on record.

D

The Yukon.

(*See Section* 11 *for distances.*)

G. M. DAWSON, 1887.

Area drained by the Yukon.

The Yukon drains an area of 330,917 square miles, of which 15,768 miles are in Canadian and 180,144 square miles in United States territory.

G. M. DAWSON, 1887.

Navigability of the Yukon.

The Yukon is navigable for small steamers from its mouth to Miles Cañon, thence, after an interruption of about three miles, to the head of Bennett Lake and to an additional distance by the waters extending south eastward from Tagish Lake.

A trip up the Yukon.

"Pall Mall Gazette," 13th August, 1897.

A pleasant trip in the summer time.

The trip to the gold-fields by the Yukon River route is pleasant for tourists during the summer months. They leave Seattle (or some other Pacific Coast Port), on a well appointed ocean steamer, which proceeds up Puget Sound, passes Port Townsend and Victoria, and gets out through the Straits of San Juan del Fuca, to the Pacific. From then on the voyage is an interrupted run of 2,000 miles to Dutch Harbour, the first stop. Dutch Harbour is a coaling station and a supply point for naval vessels and the Behring Sea fleets of sealers and whalers. After a short stop there the vessel proceeds on its way north through Behring Sea, past the Seal Island of St. George and St. Paul, and up through Norton Sound to Fort Get There, on St. Michael's Island, where is located the transfer and supply station for the Yukon River. Here the traveller finds a good many native Esquimos. Here passengers and freight are transferred to large and commodious river steamers, which proceed down the coast sixty miles to the north mouth of the Yukon, a river larger than the Mississippi, that can be navigated

with large steamers 2,300 miles without a break, and which abounds in fish, the salmon being noted far and wide for their fine flavour and large size.

Navigable by large steamers 2,300 miles without a break.

As one proceeds up the river one sees innumerable Indian villages and small settlements inhabited by traders, missionaries, and Indians, all of interest to the traveller. The first two or three hundred miles is through a low, flat country, after which the mountainous country is reached, and the constant change of magnificent scenery is beyond description. At old Fort Yukon, which is inside of the Arctic circle, during the months of June and July the sun is above the horizon without a break, and all along the river during these months one can read a paper at any time during the day or night without a lamp. It is continuous daylight during this time.

Constant change of magnificent scenery.

After leaving here the next point of interest is Circle City, the metropolis of the Yukon country. Here is a large frontier town, the houses all built of logs, and while they have no pretensions to beauty they are warm and comfortable. Circle city has a population of nearly 2,000 people, and some of the best placer mines in the country are located near this place. From here the traveller proceeds up the river 240 miles farther, and finds Fort Cudahy at the mouth of Forty-Mile Creek. This is a thriving town, similar to Circle City, but not so large. It is the supply point for the mines in the forty-mile district. Prosperous for the last four years, it has turned out a great quantity of gold, this being the first important district where coarse gold was discovered. A little farther on is Dawson City and 65 miles over the hills are the Klondike placer mines.

Circle City and Fort Cudahy.

Dawson City and the placer mines.

E

The Klondike River.

(*See Notes No.* 1 *for particulars of this River.*)

The GLOBE *of July* 28*th states that the Klondike River is* 300 *miles in length. If so—even* 200 *miles—its head waters must extend to the navigable waters of the Peel River, which joins the Mackenzie at its mouth. Thus, these rich quartz reefs can be reached by river steamers from Mackenzie Bay. Mr. de Windt gives* 150 *miles as the length of the Klondyke.*—E. J. D.

Length of the Klondike River

F

The Tatonduc, Porcupine and Peel Rivers.

WM. OGILVIE, 1887-88.

Ogilvie's journey from the Yukon to the mouth of the Mackenzie across country and down the Porcupine.

About 14 miles above the mouth (junction of Tatonduc and Yukon Rivers) the forks are reached. One branch comes from the S.E. and the other (down which Ogilvie travelled) from the S.E. The Indians state that the latter rises in a plateau three days, Indian travelling, away (about 40 miles). and in the same plateau a stream rises which flows to the north, probably into one of the head streams of the Peel River. The Boundary Line between Alaska and the N. W. Territories crosses the Tatonduc a short distance below the Forks . . . .

Leaving the river (about 40 miles from its mouth) and continuing about a mile up the valley of a small stream coming from the east, we reached the top of a low ridge which forms the watershed between the waters of the Tatonduc and those of the stream which the Indians assured me flows into the Peel.

The Peel River near the headwaters of the Porcupine.

I had much difficulty in understanding this, as I could hardly believe that the watershed was so near the Yukon, and it was not until they had drawn many maps of the district and after much argument that I gave credit to their statements. I then proposed to go down this stream to the Peel and to reach the Mackenzie in that way, but they professed to be horrified and frightened . . . caused me to decide not to try it.

It seemed improbable that this river ran as the Indians said, but I afterwards procured other evidence which proves that it does. The river has been named "Ogilvie River" by Mr. J. Johnson, Geographer to the Department of the Interior. From evidence which I obtained from Mr. McDougal of the Hudson's Bay Co. and others, I ascertained that this "Ogilvie River" joined the Peel about 60 miles above Fort Macpherson but that it was impassable in many places.

The country undulating, wooded and not rocky.

There are mountains close to the headwaters of the Tatonduc River, but beyond the country is undulating, not rocky, and more or less wooded.

From the Tatonduc to the Porcupine by the track I followed is 16½ miles. Of this distance 13 miles is drained by the river flowing into the Peel. Distributed over this 13 miles are 10 small creeks which unite 8 or 10 miles down the valley. I did not go down to the junction but could, from some places, see the stream formed by the union, and although so near its head it appeared to be as large as the Tatonduc is about midway of its course.

. . . .

Flat country and much grass.

This plateau, except for the ravines in which the creeks run, is tolerably flat. It slopes to the east down the river, and is, as far as can be seen, undulating and wooded. Lat. 65° 25′. Where the woods are open there is much fine short grass.

The Upper Porcupine a fine volume of water and three lakes.

Where I met the Porcupine it is a large creek flowing northward. . . . . The valley can be seen for about six miles up when it turns to the west and goes out of sight. The stream flows in a bed of fine gravel and the volume of water was large for the time of year (March). About half-a-mile below this, it enters a lake three or four miles long and upwards of a mile wide. Two other lakes follow this one at short intervals. These three lakes I called the Upper, Middle and Lower Na-hone Lakes. Below these the river (the Porcupine) is twice the size that it is above. It flows in a valley about a mile wide, well-timbered on the bottom, much of the timber being of fair size, on some of the flats are found many trees over a foot in diameter, long, clean-trunked, and well suited for making lumber.

. . . .

A large river from the West flowing into the Porcupine.

About five miles below the lower lake a large branch comes in from the west. Perhaps this should be called the river as it is much larger than the branch I came down, both in width and volume of water. It comes from the S.W., and has quite a large valley which can be seen from the junction of the two streams for a distance of eight or ten miles.

The Indians had told me of a large creek down Porcupine River heading near another creek which flows into the Lewes (Yukon). They used to go up the latter cross over to the Porcupine and go down it to fish. From their description and the distance they said it was below the lakes, I first thought this creek to be the one referred to, but afterwards I saw another branch of the Porcupine further down which is probably the one they spoke of.

Timber and shrubbery large and strong in the upper waters country of the Porcupine.

A short distance down the Porcupine, six miles below the Lower Lake the Lat. is 65° 43′ and Long. 139° 43′ West of Greenwich. The mean height of the barometer here during May (I camped here until the ice broke) was 27.60 inches, indicating an elevation of about 2,000 feet above sea level. Notwithstanding the high elevation and latitude, the timber and shrubbery in the bottom of the valley grew as large and strong as on the Upper Lewes River in 5 degrees lower latitude.

Surrounding my camp was a timber-covered flat about 2 square miles in area, on which grew many nice trees, upwards of a foot in diameter. Nearly all of these were spruce, but there were also some clumps of cottonwood, the trees on which nearly averaged as large as is the same species along the Athabasca and Peace Rivers. Willows are abundant along the streams, and grow as large as they generally do in other parts of the territory—4 to 5 inches thick. A few white birch were seen.

Deer, beaver, otter, rabbits and game in abundance.

Owing to the isolation of this district, animal life is abundant. Beaver, otter, marten, rabbits, and numberless cariboo . . . . Tracks of fox and lynx were also seen. Ptarmigan were numerous, and many pretty birds. Moose are very numerous.

The ice cleared sufficiently for boat navigation on May 28th, the date I started down the Porcupine.

About 22 miles below the Lower Lake, and 17 miles from the other large branch from the S.W. we came to

another flowing in from the west. This is, I believe, the creek by which the Indians used to come in from the Lewes. Here are many old racks for drying fish, from which I call this creek the "Fishing Branch" of the Porcupine . . . . There are no dangerous rapids on this (the Porcupine) river, but it is all swift, running over a bed of lime gravel . . . . steamers drawing 2½ feet could navigate this stream even in summer. Sights were taken from point to point, and distances estimated. From the Lower Lake to Bell River, following all the windings of the river, is a distance of about 216 miles.

(*See Section* 11 *for distances*).

The old Indian route across from the upper Yukon to the Upper Porcupine.

G

The Stewart River.

WM. OGILVIE, 1887.

Alexander McDonald, who has been mentioned before, reported to me that the gold on the upper river (of the Stewart) was somewhat coarser than that on the lower (near the mouth). . . . . He seemed satisfied with the result of his season's prospecting and intended spending the next season there.

A. McDonald thinks well of the headwaters of the Stewart River.

Many of the miners who had spent 1886 on the Stewart River and 1887 on the Forty Mile River seemed to think the former the better all round mining field, as there were no such failures there as on the Forty Mile, and they declared their intention to make their way back to the Stewart.

So do other miners.

Between Klondike River and Stewart River, a large creek called Indian Creek, flows into the Yukon and rich prospects have been found on it, and no doubt it is in the gold-bearing country between the Klondike and Stewart Rivers, which is considered by all the old miners the best and most extensive gold country ever found. Scores of them would prospect it but for the fact that they cannot get provisions up there, and it is too far to boat them up from here (Cudahy) in small boats. The new find will necessitate an upward step on the Yukon and help the Stewart River Region.

Evidence of rich gold finds towards the upper waters of the Stewart which this Company proposes to approach from the Peel River.

Good gold found on the head waters of the Stewart river tributaries.

Further South (from the Klondike) yet lies the heads of several branches of the Stewart River on which some prospecting has been done this summer (1896) and good indications found, but the want of provisions prevented development.

The Stewart richer than the Klondike

"It is said that the Stewart River, which drains an immense area into the Yukon, has been discovered to be much richer than Klondike."

From the London "Standard's" Special Correspondent, 26th August, 1897.

NEW YORK.

The Stewart River placers surpass those of the Klondike

A telegram from Ottawa explains why Canada has neglected the Edmonton route to Klondyke mentioned in the letter published in *The Standard* of the 17th instant, from a Correspondent who subscribes himself "Sixteen years in Canada." Canada is quietly sending out explorers thither, being informed that the placers on the Stewart River surpass those of Klondyke. But it desires to postpone any immigration at present, until the administration has been perfected, and the journey rendered safe.

Mr. DE WINDT, in the "Daily Telegraph," 12th August, 1897.

The Stewart River rich in gold-bearing quartz.

"The Stewart River, some eighty miles away, is also extremely rich in auriferous quartz, and is likely before long to come into prominence as a gold-bearing region.'"

W. OGILVIE, 1888.

The navigability of the Stewart River, and the nearness of its head waters to those of the Peel River.

While at the mouth (of the Stewart River) I was fortunate enough to meet a miner who had spent the whole of the summer of 1887 on the river and its branches, prospecting and exploring. He is a native of New Brunswick, Alexander McDonald by name, and has spent some years mining in other places, but was very reticent about what he had made or found. McDonald, speaking of his journey to the head waters of the Beaver River, states that he went to the head of this branch of the Stewart River, and found terraced

gravel hills to the west and north: he crossed them to the north, and found a river flowing northward. On this he embarked on a raft, and floated down it for a day or two, thinking it would turn to the west and join the Stewart, but finding it still continuing north, and acquiring too much volume to be any of the branches he had seen while passing up the Stewart, he returned to the point of departure. . . . .

The Peel River and the Stewart nearly meet and both navigable.

It is probable that the river flowing northwards on which he made a journey and returned, was a branch of the Peel River. . . . Judging from all I could learn it is probable that a light draught steamboat could navigate nearly all the Stewart River and its Tributaries.

R. G. McCONNELL, 1888-89.

Stewart River, the principal tributary of the Yukon, ... is reported to be navigable for a distance of nearly 200 miles above its mouth, but has not yet been ascended by the steamers plying on the Yukon.

H

MacMillan River.

G. M. DAWSON, 1887.

The Stewart and MacMillan Rivers navigable for a considerable but unexplored distance.

The MacMillan and Stewart Rivers are navigable for steamers for a considerable, though unknown, distance. I (G. M. Dawson) met a couple of miners (Messrs. Monroe and Langtry) who had ascended the MacMillan for several days in a boat. They reported the distance of a large area of low land with good soil, and had met with no impediments to navigation as far as they had gone.

The Porcupine Mackenzie Route.

G. M. DAWSON, 1887.

From the Mackenzie to the Yukon a preferable route.

One result of this journey (Campbell, 1850) was to show that the route from Fort Selkirk, by way of the Porcupine River to the Mackenzie, was preferable to that originally discovered.

Fine gold has been found at the mouth of the Porcupine, indicating the presence of gold-bearing bars or reefs on its upper reaches.

(*See Section* 11 *for distances.*)

I

The Pelly River.

G. M. DAWSON, 1887.

The Pelly navigable and gold bearing

From the site of old Fort Selkirk the Pelly might be navigated by small steamers to within 50 miles of the site of old Fort Pelly Banks.

Along the Upper Pelly there are large masses of quartz, quartz gravel and placer bars, no doubt gold bearing.

(*See Section* 11 "*Distances of Chief Rivers, etc.*")

J

The Lewes River.

G. M. DAWSON, 1887.

The great waterway from the South; gold bearing tributaries

The Lewes is the chief branch, if not a continuation, of the Yukon which it joins at Fort Selkirk. It is the chief waterway by which miners enter the Yukon district from the South. It is referred to, in this respect, under section 10—"Distances of Chief Rivers, &c." Gold is found in small quantities along almost its entire course, though chiefly on its tributaries. Dawson states (1887 Report), that "quartz vein-stuff is much less important as a constituent of the river-gravels (of this river) than it is on the Upper Pelly, Upper Liard and other streams to the eastward.

(*See Section* 11 *for distances.*)

K

The Liard, Francis and Dease Rivers; also Dease and Francis Lakes.

Evidence of G. M. DAWSON, LL.D., Director of the Geological Survey of Canada to 1888 Committee of the Senate.

The upper Liard too broken for continuous navigation

From its mouth at Fort Simpson (Mackenzie River) the Liard is probably navigable for steamers, in a southerly direction, for about 200 miles, or the mouth of

the Nelson or East branch. The river above this place to the mouth of the Dease is generally very swift and dangerous, with numerous narrow cañons.

The Devil's Portage.

The Devil's Portage is four miles long, over a mountain 1,000 feet high. This part of the river is navigable for boats only with great difficulty, and had always been accounted the most dangerous in the region. The south-west branch of the Liard, known as the Black Turnagain, or Mud River, is reported to have a moderate current, and may prove of use as a means of communication.

The upper Liard and Francis Rivers.

The Liard, above the mouth of the Dease, and the Francis River, its main tributary, were ascended by me in boats last summer. There is one bad cañon just above the mouth of the Dease and two in the Francis River, and these streams could only be navigated for short lengths.

The Dease River and Dease Lake.

The Dease River is about 140 miles in length. There are several rapids, and it is scarcely navigable by steamers under the most favorable circumstances. It is already navigated by large flat-bottomed boats. At its head is Dease Lake, 26 miles in length, on which there is a small steamer. Francis Lake, at the head of the above-mentioned river of same name, has two arms running northwards, and has a total navigable length of 54 miles.

(*See Section* 11 *for distances.*)

The Liard River.

(*See Section* 11 *for distances.*)

R. G. McCONNELL, 1888-89.

Hell Gate—the worst break on the Liard.

The Liard is navigable from Fort Simpson—its mouth in the Mackenzie River to Fort Liard and thence on up the West branch as far as Hell Gate. Above Hell Gate its navigation, owing to the numerous rapids and cañons, is exceedingly difficult and dangerous even with small boats. The Nelson or East branch of the Liard reported to be navigable by small steamers for 100 miles or so above its mouth.

Dangers of the Liard Route.

The Liard route full of terrors.

Mr. Warburton Pike in his work, "The Barren Grounds of Northern Canada" (published 1892), says he would have preferred the Liard route from Fort Simpson to the Pacific Coast, but—"the Liard itself is so full of terrors even for the hardy *voyageurs* of the North" that he could not induce guides and boatmen to accompany him.

Formerly the Hudson's Bay Co. had an establishment at Fort Halkett on the West Branch of the Liard, but the difficulties of conveying supplies, and the frequent occurrence of starvation made it a hard post to maintain; finally a boat's crew were drowned by a capsize in one of the worst rapids, and the fort was abandoned.

R. G. McCONNELL, 1888-89.

The Hudson Bay Company's old route to the Yukon.

From its (Liard) junction with the Dease River to its mouth this river is 470 miles long . . . . The Hudson's Bay Company used this river for years as a trading route to the Yukon, but the difficulties of navigation caused the Company to look for an easier route to the fur fields on the West of the Rockies, and they changed to a route from the Pacific *viâ* the Stickine and Dease Rivers. The Liard River is navigable for shallow draught steamers from its mouth to Hell Gate, but from there to Devil's Portage it has to be portaged. The rest of the way to Dease River is very rough in places, and consequently scarcely navigable by steam craft.

This river has about 240 miles of navigable waters.

(*See Section* N.—"*Old Stickine Route.*")

From the Liard to the Pelly.

G. M. DAWSON, 1887.

From the confluence of the Dease and Liard (the latter at this point is 840 feet in width and 6 feet deep), to Frances River the distance is 45 miles.

From this confluence to the lower end of Frances Lake the distance is 135 miles. Frances Lake is about 33 miles in length. Finlayson River, entering the West arm of Frances Lake is 22 miles long, navigable for boats, and Finlayson Lake—where Finlayson River rises—is 9½ miles in length. From this lake to the Pelly River is only a distance of 15 miles.

An old route of the Hudson Bay Company.

Gold on the Liard and Francis Rivers.

With regard to gold on the Liard I may state that remunerative bars have been worked on its upper waters and a long way down towards the Mackenzie. The whole appearance of this country leads to the belief that important mineral deposits will be found in it, besides those placer mines. There are large quantities of quartz ledges along the rivers; in many places on the Liard River, half the river gravel is composed of quartz and the whole country is full of quartz veins, some of which are likely to yield valuable minerals.

Important Mineral deposits will be found on the Liard: country full of quartz veins. Dawson's report.

Gold has been found on many Tributaries of the Liard and Francis Rivers.

Francis Lake.

This lake is at the headwaters of the Liard and Dawson reports that in general appearance the rocks of Francis Lake very closely resemble those from which the rich placer gold deposits of Dease Lake (Cassiar) are derived . . . Where Finlayson River enters Francis Lake and along the shores of the lake there is a notable abundance of quartz containing gold.

Gold-bearing quartz about Francis Lake

Road from Francis Lake to Pelly Banks.

Evidence of Mr. JAMES ANDERSON, quoting the diary of his father the explorer, before the 1888 Committee.

A portage (bad), 20 miles to the head of the Cordellais Cascades, Finlayson's Branch, thence possible to navigate a canoe about 40 miles to Beaver Forks, thence 18 miles to Finlayson's Lake; river insignificant, much barred with trees, but it is possible to get a middle-sized canoe up light; thence across Finlayson's

The Upper Liard River.

Lake, 22 miles, a short portage to another small lake, 3 miles long, whence the waters run westward, thence a small (Beaver) creek which passes through some small lakes out of the direct course, thence a portage 40 miles through thick woods, with the exception of two small lakes and a short piece of river falling into the Pelly, in all perhaps 7 miles, to the Pelly River.

L

Dease River.

G. M. DAWSON, 1887.

This river has a total length, following all its sinuosities from Dease Lake to the Liard River, of 180 miles. It is possible that the river might be navigated by small stern-wheel steamers of good power.

(*See also Section K.*)

M

The Peace River.

(*See also Section* 20.—"*Population of the future.*")

Extent of navigable waters on the Peace.

The Upper Peace River is navigable for steamers drawing 3 or 4 feet, and with a little improvement at two points a draught of 5 or 6 feet could be utilized. The Upper Peace River affords a navigable stretch of 557 miles, which, with 222 miles on Lower Peace River, gives a total of navigation of 779 miles only, broken at one point by a rapid 18 miles in length.

Coal on the Peace River.

Coal from the Peace River to the Arctic Ocean.

Malcolm McLeod, Q.C., ex-Judge, gave evidence to the 1888 Committee that coal was to be found for 350 miles along the upper reaches of the Peace River and extends to the Arctic Ocean.

Distances and description of the Peace River.

G. M. DAWSON'S Evidence before the Committee of the Senate, 1888.

Distances on the Peace River from Fort Chippewyan.

The following is a summary of Mr. Ogilvie's Departmental Report of 1884 upon the Peace River from Athabasca Lake to Dunvegan. Distances:—

	MILES.
Fort Chippewyan on Athabasca Lake to Peace Point	86½
Fort Chippewyan on Athabasca Lake to head of Little Rapids...	100½
Fort Chippewyan on Athabasca Lake to Falls...	234
Fort Chippewyan on Athabasca Lake to Battle River	430
Fort Chippewyan on Athabasca Lake to Smoky River	541
Fort Chippewyan on Athabasca Lake to Dunvegan...	604

The Little Rapids are 3½ miles long, with a drop of 8 feet.

Particulars concerning the navigation of Peace River.

On the Falls there is a perpendicular drop of 9½ ft., but there is a sloping descent on one side used by boats.

One-and-a-half miles above the Falls there is a rapid 300 yards long, with a total fall for the distance of 8 ft.

The York boat and scows pass up and down through all these, and Ogilvie states that, with the exception of Little Rapids, the Falls and rapids near them, and two shoal places—one near the mouth of Smoky River and one between Smoky River and Dunvegan—the river is navigable at low water for boats drawing from 5 to 6 ft.

Above Dunvegan it appears that there are no serious impediments to steamer navigation to the Rocky Mountain Portage, a distance of about 135 miles.

Thus, provided means are adopted for overcoming the possible impediment of 3½ miles at Little Rapids and 1½ mile at the Falls and rapids, the Peace River might afford a length of steamer navigation of about 740 miles.

At the Rocky Mountain portage is an impassable cañon with a portage of 12 miles. This constitutes the head of steamer navigation, as from this place to west side of Rocky Mountains (about 88 miles) there are several bad rapids.

The Peace is formed by the confluence of the Finlay and Parsnip Rivers west of the mountains. These are streams of about 500 feet wide. From the confluence the Parsnip might, possibly, be navigated by a small steamer for 50 or more miles southward. Little is known of the Finlay, but much bad water is reported.

The Smoky River, from Lat. 55° to its mouth, flows in a valley 400 to 600 feet deep, half a mile wide in the bottom and two to three miles from rim to rim. The banks are open and grassy on southern exposures. The current is swift, and there are many small rapids, so that it can scarcely be considered navigable for steamers of any kind, though it is possible that a steamer of light draught might ascend some distance at high water.

Agriculture on the Peace River.

In his evidence before the 1888 Committee the Hon. Wm. Christie, late Chief Inspecting Factor of the Hudson Bay Company, stated that the Peace River country was not liable to drought, and that it is as fine a country as he ever saw. The vegetation is luxuriant, and that for pasture there is no better country in the world than the Peace River Valley. The soil is as cultivable as that of Manitoba. Wheat crops can be relied on. Very little affected by frosts.

N

Old Stikine Route.

G. M. DAWSON, 1887.

Total distance of this route to Fort Selkirk

From mouth of Stikine River to Telegraph Creek, thence to Dease Lake, along Dease River, the Upper Liard and Pelly Rivers, to the confluence of the Lewes and Pelly (Fort Selkirk), 944 miles.

The extent of steam navigation on the Stikine River.

The Stikine is navigable by stern wheel steamers of strong engine power, drawing not more than 4 feet, for a distance of 188 miles to Telegraph Creek, 12 miles beyond Glenora.

The "Great Cañon" which extends for miles breaks the navigation beyond. A government pack-trail, 62½ miles in length, connects Telegraph Creek with the head of Lake Dease.

The Dease River, the Upper Liard and Frances Rivers—above the mouth of the Dease—can scarcely be considered navigable for steamers, though passable for large boats, with occasional portages.

The lower Liard unsuitable as a route.

The difficulties of the Lower Liard are such as to render it an undesirable route, even for boats, and scarcely suitable as an avenue of trade between the Mackenzie and B.C.

A railway from mouth of the Stikine to the Mackenzie.

Following the river-valleys, by a route practicable for a railway, from Rothsay Point at the Mouth of the Stikine to the mouth of the Dease, the distance is 330 miles; thence to Fort Simpson is a further distance of 390 miles—total from the Pacific to the navigable waters of the Mackenzie about 720 miles.

A serious obstacle to navigation on the lower Stikine.

A serious impediment occurs in the navigation of this (the Stikine) river at the Little Cañon (53 miles above the great bend) when the river is at its highest stage in June or July, in consequence of the great velocity of the current in this narrow and rocky, through gorge . . . Under ordinary circumstances the ascent of the river to Telegraph Creek, with a suitable steamer, occupies about three days, and it is generally necessary to carry a line ashore at a few places. At low tide the mouth of the river has not more than two feet of water.

Deep snow on the lower Stikine.

While snow accumulates on the river flats of the Stikine to a depth of from 8 to 10 feet, at Telegraph Creek and Tahl-tan River it seldom exceeds 18 inches, and at the latter places horses and mules have been wintering out for a number of years. Wheat, oats, barley and potatoes can be grown and ripen well on this river, and all ordinary vegetables can be produced.

A good road route from Telegraph Creek to Dease Lake.

Dease Lake is the centre of the Cassiar districts, and the construction of a waggon road from Telegraph Creek (62½ miles) would not be very difficult or expensive. By its construction it should be easy to lay down goods at Dease Lake at very reasonable rates. One good bridge over the Tooya River and 8 or 10 miles of corduroy laid down would be required. The length of Dease Lake is 24½ miles. Average width less than a mile.

This route (Stikine to Dease Lake) is an exceedingly direct one, and, taken in conjunction with the valleys of the Dease and Liard Rivers, it affords almost an air-line from the Pacific coast to the Great Mackenzie River. The distance is 720 miles.

The New Stikine Route.

(*See Section* 11 *for distances.*)

"Times," 13th September, 1897.

"TIMES" CORRESPONDENT—OTTAWA, *September* 12th, 1897.

A railway decided upon from the Stikine to the Yukon waterway.

Pending the final determination of the boundary between Alaska and the Yukon district, the Dominion Government has decided to develop the existing all-Canadian route to the new goldfields by way of the Stikeen River. Arrangements are being made with the Canadian Pacific Railway by which the company will proceed at the earliest possible period with the construction of a standard-gauge railway from Glenora, on the Stikeen River, to the head of the navigable waters of the Yukon. Competent engineers have been ordered to proceed to the locality and make a survey of the country and report on the feasibility of constructing a railway connecting the waters of the Stikeen with those of Teslin Lake and the Yukon. Upon receipt of their report the construction will be begun. The length of the line will be about 150 miles. The company will run a line of first-class steamers between Vancouver and Glenora.

It is believed that the magnitude of the trade of the Yukon district demands such a service. Altered con-

ditions in transport and facilities for reaching the Klondike goldfields by an all-British route will secure to the coast cities of British Columbia a large share of the trade of this northern country.

"EVENING STANDARD," October 7th, 1897, from its special Correspondent.

Another route which is growing in favour, owing to the difficulties of the mountain Passes this Fall is the Sticheen River route, also known as the "All Canadian,' because it is confined to Canadian territory. It has the additional recommendation of being approved by Dr. Dawson, Director of the Geological Survey, who travelled by way of Teslin Lake ten years ago, and advocated the building of a road in this direction. The head of navigation is still called Telegraph Creek, and this route is dignified on the map with the name of "Government Trail." Whether it exists anywhere but on the maps may be doubted, and the Government, of course, have accepted no responsibility beyond having the country explored. Still, people who have travelled by different routes claim that this is the best. An old prospector reports that the trail from Telegraph Creek to Teslin Lakes cannot be more than 115 or 120 miles long, and he describes the country as comparatively easy of travel. The trail is fairly level, and though some parts are swampy, there is plenty of timber to make corduroy, *i.e.*, to make a solid road over the bog by putting down brushwood and laying logs across it, a safe if not a very comfortable mode of travelling. Dr. Dawson says of this route:—"The river is navigable for the ordinary flat bottom boats from Salt Water to Telegraph Creek, a distance of 150 miles, from Telegraph Creek to Teslin Lake is about another 150 miles through what is believed to be a flat and not very difficult country, but very little is known about it. Mr. St. Cyr, a surveyor on the staff of the Department of the Interior, is making a survey of the country at the present time. He is expected to come out this Autumn, and when he does the practicability of the route will probably be settled.

People claim the Sticheen as the best route.

Swampy in parts. . . . a road possible but a railway difficult.

From Teslin Lake there is no difficulty whatever, there being navigation for stern-wheel steamers right down to the mouth of the Yukon. If this route proves practicable it will greatly facilitate ingress and egress to and from the Yukon country."

There is a very general opinion as to the value of this route, and, besides the Government Surveyor, the chief engineer of the Kootenay division of the Canadian Pacific Railway is investigating the locality with a view to the construction of a railway. . . . The Stikeen route involves a stretch of uncertain river navigation from Wrangell to Telegraph Creek, while the Taku Inlet has the advantage of a deep water terminus open all the year round.

A stretch of uncertain navigation on the Stikeen.

The Stikine Route Railway.

The "Financial Post," October 11th.

Notice of application for an Act to incorporate a Railway Company.

Messrs. Phillips, Wootton, and Barnard, of Vancouver, give notice that application will be made to the Legislative Assembly next session for an Act to incorporate a company with power to construct and operate a railway from the head of Stikeen River, *via* Teslin Lake to the north border of British Columbia. Also in a southerly direction to some point on the west coast at the head of Portland Canal. The construction and completion of these lines of railway would give ready access to the Yukon headwaters. Several fairly rich specimens of ore have been brought down here lately by miners from mineral ledges on the Stikeen River. We shall probably hear of good discoveries in those parts soon.

"Times," London, October 18th, 1897, through "Reuter's."

OTTAWA, October 17th.

The Stikine Railway reported officially to be feasible.

The Government Surveyors who have just traversed the route of the proposed railway to pass solely through British territory into the Yukon country, *via* the Stickeen River, report that the project of a boundary railway from Glenora on the Stickeen to Lake Tchu, from which point

there is uninterrupted navigation to Klondike, is quite feasible. The distance is about 185 miles. The Canadian Pacific Railway Company this week sent two additional engineering staffs into the district. The work of construction will be begun next spring.

Gold on the Stikine.

The Cassiar gold country.

Placer gold mining has been carried on intermittently on the bars of this river since 1861, and a "rush" took place in the following year. This was followed by exploration further into the country and the opening up of the Dease Lake District and the Cassiar country in 1873. In 1874 the output of gold was valued at 1,000,000 dollars.

O

The Tes-lin-too (Hootalinqua) River.

(*See Section* 11 *for distances.*)

G. M. DAWSON, 1887.

The new chief waterway from the South.

The Tes-lin-too is navigable for stern-wheel steamers for 150 miles or more from its mouth as far as Lake Teslin, while the Takh-heena may probably be ascended by steamers of the same class for some distance. This river (the Tes-lin-too) is no doubt destined to be the chief waterway from the South to the Lower Lewes on to the Yukon country. Payable gold-bearing bars are found along its banks and tributaries where a number of miners are now working.

P

The Big Salmon River.

G. M. DAWSON, 1887.

An important river.

Big Salmon river may probably be ascended by steamers of the same class as the Tes-lin-too for some distance. Dawson reports this river as being much more important than any other of the tributaries, joining the Lewes further down, being 347 feet wide with a depth of 5 feet, and might be navigated by stern-wheel shallow draught steamers for many miles. It runs into

"Island Lake," 190 miles from its junction with the Lewes. Though there is plenty of fine gold along this river there are no good payable bars.

Q

The Tahl-Tan River

G. M. DAWSON, 1887.

An old Indian route from the Stikine.

About twelve miles above Telegraph Creek, and on the trail to Dease Lake, the Tahl-tan River enters the Stikine. It rises about 30 miles to the north, and occupies a portion of an important valley which, still further to the north westward, carries the upper branches of the Taku River, and the furthest sources of the Lewes River. The Indians travel along this valley, and it appears worthy of attention as a route from the navigable waters of the Stikine to the Yukon basin.

R

The Chilkoot (Taiya) Pass.

G. M. DAWSON, 1887.

The White preferred to the Chilkoot Pass by Dawson.

The Chilkoot Pass is such that it would scarcely be possible to construct a useful trail across for pack animals, but the White Pass appears to offer a better opportunity for making a trail or road.

A Railway Line from Chilkoot Inlet to Fort Selkirk.

"Financial News," October 21st, 1897.

A new American railway prospect—300 miles.

According to news from San Francisco, a party of 12 engineers and surveyors has left that city for Seattle, where it will be reinforced by eight assistants and 50 others who will sail for Chilkoot Inlet in a steamer especially chartered for the trip. At Seattle 200 horses, 150 cattle, feed for six months, and 200 tons of general stores will be purchased for the party during the long drive from Klukwark, at the head of Chilkoot Inlet, to Fort Selkirk, the head of steam navigation on the Yukon, a distance of 300 miles, over a trail unfrequented during the winter.

The expedition is to determine whether a railway can be built over this 300 mile trail. The engineers will also try to locate a new pass, believed to exist north of

the Chilkoot. The organisers of the expedition are from Boston, San Francisco, and Puget Sound, and have formed a company with a capital of 200,000 dollars to meet necessary preliminary expenses. The members of the party expect to arrive in January at Fort Selkirk, where permanent headquarters for railway construction will be located. All the members of the party have been engaged for two years.

(*See Section* 11 *for distances, and Sections* 18 *and* 27 *for further particulars.*)

S

The Chilkat Pass.

G. M. DAWSON, 1887.

The Takheena River easy to navigate.

From the West Branch of Lynn Canal, a distance of about 50 miles to the lake at the head of the Tahkheena river, then down the river to Lake Labarge. The voyage down this river is said to be easier than by the main river, the rapids being less serious.

(*See Section* 11 *for distances, and Sections* 18 *and* 27 *for further particulars.*)

T

The White Pass.

G. M. DAWSON, 1887.

The route of the British Columbia Development Association

This Pass leaves the coast at the mouth of Shkagway River, four miles south of the Head of Taiya Inlet, and runs parallel to Chilkoot Pass at no great distance from it.

The distance from the coast to the summit is about 17 miles.

Ogilvie's description.

Ogilvie describes this route (1896) as commencing at Taiya Inlet, about 2 miles south of its north end; it follows up the valley of the Shkagway River to its source, and thence down the valley of another river which Dr. Dawson says empties into Taku Arm of Tagish Lake. Capt. Moore (mistakingly—it is believed) describes this stream as emptying into Windy Arm, which lies between Tagish and Bennett Lakes.

The route passes across the lakes and down the Lewes River.

First five miles is through level bottom—land thickly timbered.

The next nine miles is in a cañon-like valley, where heavy work would be encountered in constructing a trail. The remaining distance of three miles to the summit is comparatively easy.

The altitude of the summit is estimated at 2,600 feet. Beyond the summit a wide valley is entered, and the descent to the first little lake is said to be not more than 100 feet.

(*See Section* 11 *for distances, and Sections* 18 *and* 27 *for further particulars.*)

V

The Taiya Pass Route.

(CHILKOOT *is the name by which the Pass on this route is commonly known.*)

W. OGILVIE, 1896.

This, the Chilkoot Pass, is said to be impassable for horses.

This route is from Lynn Canal, Taiya Inlet and Taiya river over Taiya Pass to Lake Lindeman. The distance from the head of Taiya Inlet to the summit of the Pass is 15 miles and the whole length of the Pass to Lake Lindeman is 23 miles. Between Lake Lindeman and Lake Bennett there is only about three-quarters of a mile of river which is not more than 50 or 60 yards wide and about two to three feet deep and is so swift and rough that navigation is out of the question.

(*See Section* 11 *for distances, and Sections* 18 *and* 27 *for further particulars.*)

W

Taku Route to Lake Teslin-too.

W. OGILVIE, 1896.

A route that may possibly be found the best from the South.

Indians reported journeying down the Teslin-too River to Teslin-too Lake, and by way of a stream which entered the lake from the East they reached Taku River, and thence to salt-water on the Taku Inlet. The journey from the head of Canoe Navigation, on the Teslin-too to salt-water, on Taku Inlet, took the Indians four days if they had loads to carry, but only two days if their baggage was light.

Many years ago, in 1867 I think, a man named Monroe prospected up the Taku, and learned from the Indians something of a large lake not far from that river. He crossed over and found it, and spent some time in prospecting, and then crossed to the sea.

I (Ogilvie, Cudahy, June 10th, 1895) am thoroughly convinced that a road from the coast to some point on the head waters of the river (Yukon), preferably by the Taku, if at all practicable, would convert all our part (the Upper Yukon) of the river into a hive of industry.

A Significant Incident.

W. OGILVIE, 1898.

An incident favorable to the Taku River route.

Great anxiety is felt here (Dawson City) about a mail route and regular mail. Last winter three mails left the coast, one by the Taku route, one by the White Pass, and one *via* Taiya; the first two got here in good time, the last (ours, by the way) did not, nor is it likely to arrive for some time—may be never. The man in charge was badly frozen ón the summit, and had to turn back. . . . . An Indian brought the mail in by the Taku River and took the Slocan branch of it to Atlin Lake. From what I learned of this route while up there, it may be found to be an easier way than by Teslin Lake, but it has the disadvantage of landing on the head of the Lewes River instead of the Hootalinqua or Teslin, and so takes in the Cañon and White Horse Rapids.

G. M. DAWSON, 1887.

The Taku River route is little known as yet.

Little is yet known of the Taku River, but the Indians ascend it in canoes to a point at a distance of about 80 miles from the head of the Taku Inlet, and Indian trails lead S.E. from this vicinity to the Tahl-tan, Eastward to Teslin Lake, and N.E. to the lakes at the head of the Lewes.

"Evening Standard," October 7th, 1897.
From its Special Correspondent.

The Taku route chosen for a railway.

The Yukon Trading and Transportation Company, which obtained a Charter from the Dominion Parliament last Session, including the power to provide railway

communication, has also done some surveying and fixed on a route. Two routes are available from the coast to Teslin Lake—one by the Sticheen River and Telegraph Creek, and the other further north from the Taku Inlet. The former involves a stretch of somewhat uncertain river navigation, from Wrangell to Telegraph Creek, while the latter has the advantage of a deep-water terminus open the year round. The Taku line has accordingly been selected, with a maximum grade of only three per cent. It is comparatively a direct route, being but one hundred and sixty-two miles from Salt Water to lake Teslin. It follows the Taku River to the junction of Katuna River, thence up that river to Silver Salmon River, and finally overland to the shores of Teslin. It is the intention of the Company to proceed as soon as possible with the work of construction. A trail will be built over the proposed route, and a saw-mill will be built on Teslin Lake, where the Company has a considerable area of fairly good timber.

Comparatively a direct route.

X

Taku and Windy Arms.

G. M. DAWSON, 1887.

Points at which routes from the South meet the lakes.

The mountains rapidly decrease in height and abruptness after the summit of White Pass is passed, and the valley bifurcates, one branch leading to the head of Windy Arm of Tagish Lake, the other to Taku Arm of the same lake.

Y

Large Rivers Flowing into Hudson's Bay.

Prof. R. BELL, M.D., LL.D., of the Geological Survey of Canada. Evidence before the Senate Committee of 1888.

Important rivers by which the N. West Territories may be opened up from Hudson's Bay.

The largest navigable river is the Attawapishkat. It enters James' Bay about 65 miles north of Fort Albany, and is continuously navigable from the sea at high water as far as it will afford width for steamers, which would be, perhaps, 250 to 300 miles. I came down the whole length of the river without once taking my canoe out of the water. Within 100 miles or so of its source

there is a large lake. We named it after Lord Lansdowne. It measures 13 miles in length, and over 10 in width. Just below it is another lake nearly as large, called Attawapishkat Lake. Its general course is eastward, but it makes some large bends.

The Albany is next in point of length of navigable water. It is navigable for river steamers for about 250 miles at high water.

The Doobaunt (Telzoa River of Tyrrell, 1893), flowing into Chesterfield Inlet is probably the next in point of size. Length not given. The inlet runs in about 250 miles from the sea. Lake Aberdeen and other large lakes extend the deep navigable waters of the Inlet quite 250 miles further almost due west. A large river flowing in from the west probably extends the navigable waterway right on to Great Slave Lake. The great whaling ground of Hudson's Bay is opposite this Inlet.

The Moose River and its branch the Missanabie would be navigable for about 120 miles from the sea at high water.

The Kapishcow and Equan Rivers, also on the west coast of James' Bay, are navigable for a considerable distance by steamers, as also are the Hayes, Steel and Hill Rivers; these three are all parts of one river, navigable 140 miles altogether from the sea.

The Great Nelson River is only navigable for about 50 miles from its mouth; again for 150 miles (with only one break) in the central part of its course, and also for about 40 miles from the outlet of Lake Winnipeg.

(The Churchill River has a considerable length, but little of it is fit for steamer navigation.)

(*For further particulars of routes afforded by any of these rivers, see Sections* 21, 22 *and* 26.)

Section 11. Distances of Chief River, Sea, Lake, and Overland Routes.

(For further particulars of these routes, see Sections 8, 10, 18, 21, 22, 26 *and* 27.)

Routes from Liverpool to the Yukon Goldfields.

CHESTERFIELD INLET ROUTE.

	MILES.
Liverpool to Chesterfield Inlet	2,800
Length of Chesterfield Inlet (navigable) ...	250
Inlet to Great Slave Lake (over half of river navigation)	820
Across Great Slave Lake (navigable)	300
Great Slave Lake to McPherson Fort ...	962
Fort McPherson viâ Peel River to the region of headwaters of Stewart River (navigable)	250
	4,882

CANADIAN PACIFIC, VIA LYNN CANAL ROUTE.
(This route includes dangerous rapids and mountain passes.)

Liverpool to Vancouver, viâ Canadian Pacific Railway	5,713
Vancouver to Klondike River, viâ Lynn Canal	1,600
	7,313

CANADIAN PACIFIC, VIA ST. MICHAEL'S ROUTE.
(This route is fairly comfortable, but very long and through American territory.)

Liverpool to Vancouver, viâ Canadian Pacific Railway	5,713
Vancouver to Klondike River, viâ St. Michael's and the Yukon	4,350
	10,063

W. Ogilvie's Distances, 1896.

ST. MICHAEL'S ROUTE.

	MILES.
San Francisco to Dutch Harbour	2,400
Seattle or Victoria to Dutch Harbour	2,000
Dutch Harbour to St. Michael	750
St. Michael to Cudahy (up the Yukon)	1,600
Victoria to Cudahy	4,350

ROUTE VIA TAIYA (CHILKOOT) PASS.

Victoria to Taiya	1,000
Taiya to Cudahy	650
Total	1,650

ROUTE VIA STIKINE RIVER.

Victoria to Wrangell (sea)	750
Wrangell to Telegraph Creek (via Stikine River)	150
Telegraph Creek to Teslin Lake. (Overland) ...	150
Teslin Lake to Cudahy	650
Total	1,700

Government Map Measurements.

ROUTE VIA BEHRING STRAITS AND MOUTH OF MACKENZIE RIVER, TO THE PEEL, PORCUPINE AND YUKON RIVERS.

Approximate—

Victoria to Mouth of Yukon	2,700
Thence to Mackenzie Bay	1,400
Mackenzie Bay to Fort Macpherson	100
	4,200

Fort Macpherson to Dawson City.

	Miles.
Fort to La Pierre's House	80
(In summer this route can be done by water with less than one mile of portage through McDougall's Pass).	
La Pierre's House to junction of Porcupine and Yukon Rivers (navigable by steamers) ...	290
From this junction to Dawson City	230
Total	600

La Pierre's House to Dawson City, via Upper Porcupine River.

La Pierre's House to Junction of Bell and Porcupine Rivers. (Navigable by steamers) ...	30
Junction to Head Waters of the Porcupine River... (Navigable by steamers).	216
Near Head of Porcupine to the Tatonduc River ... (Overland.)	16½
Down the Tatonduc River to Junction with Yukon River. (Navigable by steamers)	40
From Mouth of Tatonduc to Dawson City ... (Along the navigable Yukon.)	75
Total... ...	377½

Fort Macpherson to Headwaters of the Peel River 300
(No impediments to navigation.)

The distances, land and water, separating the Headwaters of the Peel from those of the MacMillan, Stewart and Klondike Rivers, are unknown, the country being quite undiscovered, but occasional travellers' reports and the lengths of the different rivers indicate that the Peel River runs very close to the last mentioned rivers, and is probably connected with them by intervening lakes and navigable streams.

(*See reports on the MacMillan, Stewart and Klondike Rivers, Section* 10.)

G. M. DAWSON, 1887.

Fort Selkirk to Lynn Canal	377	miles.
,, ,, Chilkoot Pass	224	,,
,, ,, Hotalinqu River	294	,,
,, ,, Pelly Banks	213	,,
,, ,, Head of Pelly Lake (above "Pelly Banks")	276	,,

The Upper Pelly.

G. M. DAWSON, 1887.

	River Windings.	Straight Line.
	MILES.	
Pelly Banks to Hoole Cañon	50	31
Hoole Cañon to Ross River	23	16½
Ross River to Glenlyon River	82	64
Glenlyon River to MacMillan River* ...	91	61
MacMillan to Lewes River (Fort Selkirk) ...	74	46
	320	218½

* *See* under heading, "MacMillan River." Section H.

From Fort Selkirk (mouth of the Lewes River) to the MacMillan River the Pelly is navigable for large sized stern wheel steamers, and right on to Hoole Cañon for small stern wheel steamers.

The Ross River is navigable for steamers at its mouth, but its upper part is quite unknown.

Hoole Cañon is quite impassable for a steamer of any kind, and 18 miles further on at the mouth of Hoole River it might prove difficult.

Further on the Pelly is navigable for small steamers right on to Pelly Banks, and possibly as far as the lakes.

Dawson's Distances from Fort Selkirk to Taiya Inlet.

	Miles.
Fort Selkirk to Rink or Five Finger Rapid ...	55
Rink Rapid to Little Salmon River	53
(Coal beds found 5½ miles above Rink Rapid.)	
Little Salmon to Big Salmon River	34
(Numerous lignite-coal beds below Big Salmon River. Depth of B. S. River 5 feet; width at mouth, 347 feet.)	

	Miles.
Big Salmon to Tes-lin-too River	31
(Tes-lin-too River. Width, 575 feet at mouth; depth, 18 feet. From the mouth of this river to the lake is about 100 miles. Teslin Lake is 100 miles in length. From near head of lake to Taku River is about 60 miles, a good trail. Indians travel up continuation of T. River from lake about 100 miles, and cross up West Fork to tributaries of the Upper Liard, and down that river to the Dease.)	
Tes-lin-too River to Lake Labarge	27½
Lake Labarge, length	31
(This lake is reported to be so stormy as to detain miners in camp for several days.)	
Lake Labarge to Tahk-heena River	11½
(Length of T. River 50 miles, easy navigation. Depth, 10 feet; width at mouth, 237 feet.)	
Mouth of Tahkheena River to White Horse Rapids	18
White Horse Rapids to Miles Cañon	2¼
(Usual to portage these Rapids; too dangerous to navigate.)	
Miles Cañon to Lake Marsh	23
Lake Marsh	20
River from Marsh Lake to Tagish Lake	5
Tagish Lake	16·6
Lake Nares	2·7
Bennett Lake	25·8
Stream from Lake Bennett to Lake Lindeman	¾
(Not navigable for heavily laden boats.)	
Lake Lindeman	5
Lake Lindeman to Tide Water of Taiya Inlet	23½
	401

* This distance is over the Chilkoot or Taiya Pass. From Lake Lindeman to summit of Pass is 8½ miles.

The elevation of the Pass is 3,502 feet.

The traverse of the Chilkoot portage is itself a formidable obstacle.

Distances from Head of Chilkoot Inlet to the Boundary Line on the Yukon River between N. W. Territories and Alaska.

(W. OGILVIE, 1887-88.)

	MILES.
Haine's Mission (Head of Inlet) to entrance of Taiya Inlet	4·79
To Head of Taiya Inlet...	20·12
,, Head of Canoe navigation, Taiya River ...	26·02
,, Forks of Taiya River	28·50
,, Summit of Taiya Pass	34·88
,, Landing at Lake Lyndeman	43·18
,, Foot of Lake Lyndeman	47·61
,, Head of Lake Bennett	48·21
,, Boundary line between B. C. and N. W. T. (Lat. 60°)	58·21
,, Foot of Lake Bennett	73·97
,, Foot of Cariboo Crossing (Lake Nares of Schwatka)	76·56
,, Foot of Tagish Lake	93·37
,, Head of Marsh Lake	98·27
,, Foot of Marsh Lake	117·33
,, Head of Cañon	143·06
,, Foot of Cañon	143·68
,, Head of White Horse Rapids	145·07
,, Foot of White Horse Rapids	145·45
,, Tahk-heena River	160·04
,, Head of Lake Labarge	178·19
,, Foot of Lake Labarge	204·34
,, Tes-lin-too River (Newberry of Schwatka)	236·00
,, Big Salmon River of Miners (D'Abbadie of Schwatka)	269·45
,, Little Salmon River of Miners (Daly of Schwatka)	305·66
,, Five Finger Rapids (Rink Rapids of Schwatka)	364·95
,, Pelly River	423·41
,, White River	519·23
,, Stewart River	529.03
,, Sixty Mile Creek	*551·00
,, Dawson City (Klondike)	*597·00

	Miles.
To Fort Reliance	602·32
„ Forty-mile River	647·20
„ Boundary Line between N.W. Territories and Alaska	687·55

* These are not Ogilvie's Measurements.

Distances from Fort Macpherson to Fort Chipewan.

(WM. OGILVIE, 1887-88.)

Mackenzie River, Proper	32·1
Red River...	60.1
A large river entering from the East (name unknown)	120·5
Loon River	250·8
Hare Indian River	272·4
Fort Good Hope	274·7
Ramparts	283·6
Beaver River	295·7
Sans Sault Rapids	322·7
Mountain River	323·3
Carcagou River	328·0
Great Bear River	444·0
Fort Norman	444·2
Gravel River	509·3
River Le Vieux Grand Lac	550·5
Fort Wrigley	624·5
River between two Mountains	628·0
Willow Lake River	667·0
Ne-hauner River	683·3
Fort Simpson	758·5
Head of Tine	829·5
Yellow Knife River	855·6
Little Lake	892·0
Fort Providence	916·0
Great Slave Lake	962·0
Hay River	997·0
Buffalo River	1,024·0
Buffalo Creek	1,071·0
Fort Resolution	1,083·0

	MILES.
Fort Smith	1,273·5
Head of Rapids	1,287·5
Peace River	1,358·9
Fort Chipewan	1,390·0

Evidence of Prof. ROBERT BELL, M.D., LL.D, &c., before the Select Committee of the Senate of Canada, 1888.

The possible avenues of communication with the Mackenzie Basin are :—

	MILES.
From one of the eastern bays of Great Bear Lake to the nearest point on the Coppermine River the distance is	40
From Chesterfield Inlet to the head of the Great Slave Lake is	320
A large unknown river mentioned by Tyrrell, 1893, running into Aberdeen Lake at the head of this Inlet, along with the lakes, would lessen this overland distance considerably, if not cover it the whole way by a navigable waterway.	
The harbor at Churchill to the head of the Athabasca Lake is	440
Prince Albert on the Saskatchewan to Fort McMurray, the junction of Clearwater and Athabasca—that point being chosen because there is then between that and the sea ...	300
Fort Pitt to Fort McMurray the distance is ...	300
Edmonton to Fort McMurray	225
Banff to Peace River Landing	250
The Head of Little Slave Lake to Peace River Landing...	63
Head of Navigation on Stikine River to Fort Liard, the head of Navigation on the Liard River	370
Hazelton, presumably the head of navigation on the Skeena River, to the big bend of the Peace River in the Rocky Mountains	150

Distances to points on Peace River from Fort Chippewyan on Athabasca Lake.
(*See part M, Section* 10.)

Distances on the Liard, Dease and Francis Rivers.
(*See part K, Section* 10.)

Athabasca Landing to Great Slave Lake.

GEO. DAWSON and W. OGILVIE, 1888 Committee.

(The distance from Edmonton, a terminus of the Canadian Pacific Railway, to Athabasca Landing is 90 miles—already covered by a good wagon road).

The first part of the route from Edmonton to the Yukon Goldfields via the Mackenzie River to its mouth.

The Athabasca River is navigable by steamers from the Landing to the First Rapids—distance 120 miles. These rapids can be navigated by steamers drawing two feet. A deeper channel could easily be constructed.

The second rapid is 28 miles further on, and is more easily navigable, and by vessels of deeper draught.

The Grand Rapids are 23 miles further on, or 166 from the Landing, and are about two miles long. These rapids are not navigable.

Rapids de Roches are 194 miles below the Landing. The passage is rough and stony, and is impassable for canoes. Large boats in passing have to be lowered by ropes from the banks.

Between Rapids de Roches and the last rapid, 251 miles from Athabasca Landing, Ogilvie states that it is almost one long rapid. Fort McMurray is near this last rapid.

From the last rapid, to Lake Athabasca, is a distance of about 170 miles. In the evidence of Wm. Jas. McLean, Chief Trader of the Hudson Bay Co., to the 1888 Committee, he stated that the Slave River is navigable from Lake Athabasca to the Rapids near Fort Smith, 80 miles (the rapids break the river for about 14 miles) and from Fort Smith to Great Slave Lake, a distance of about 150 miles. Total distance 246 miles, including rapids.

Lengths of some of the Chief Lakes.

Lesser Slave Lake, 90 miles in length.
Lake Athabasca, 192 ,,
Isle à la Cross Lake is 36 ,,
Clear Lake and Buffalo Lake with Isle à la Cross Lake give a navigable length of 74 miles.
Lac la Biche is 24 miles in length.
Cree Lake, 40 ,,
Green Lake, 18 ,,
Reindeer Lake, 165 ,,
Great Slave Lake, 300 ,,
Great Bear Lake is 190 (width 110).
Wollaston or Hatchett Lake is 70 (same in width).

Francis Lake, navigable length	...	54	miles.
Dease Lake	,, ,,	...	24⅓	,,
Finlayson Lake	,, ,,	...	9½	,,
Lake Lansdowne (on Attawapishkat River)			13	,,
Lake Attawapishkat	... ...	...	12	,,
Lake Aberdeen (at the head of Chesterfield Inlet), navigable length		...	50	,,

(*For the lengths of Lakes on the Lewes River route to the Yukon see Section* 11.)

Route from Athabasca Landing to the Peace River.

Evidence of Wm. CHRISTIE to 1888 Committee.

	Miles.
From the mouth of Little Slave River on the Athabasca River to Lesser Slave Lake (navigable)	100
Length of Lesser Slave Lake (navigable)	90
Portage from Lesser Slave Lake to the Peace River	80

Section 12. Ice on Rivers and Lakes.

Ice on Mackenzie and Tributaries.

R. G. McCONNELL, 1888-89.

The ice is clear in the Liard River about May 1st, at its mouth in the Mackenzie River about May 20th, in

Great Slave Lake towards the end of June, about which time the whole of the Mackenzie River is open.

Ice begins to form again towards the end of October, and about the middle of November, the streams are frozen over.

This gives about four months clear navigation. Ice breaks (sufficient for navigation by stout vessels) at Fort Norman 19th May, Fort Good Hope 21st, near Fort Simpson 1st of June.

Mr. Ogilvie states (1887) that ice closes in at Fort Norman about 1st week in November, and at Fort Simpson it closes in about 3rd week in November.

The ice leaves the river at Fort Macpherson about June 1st.

Mr. James Mackenzie states that his father—the explorer—always left Fort Simpson and proceeded down the Mackenzie in May. (Committee report, 1888).

Ice on Great Slave Lake.

R. G. McCONNELL, 1888-89.

Ice forms in this lake between 20th and end of October, and is fast by the middle of November. The ice breaks about 1st July, and sometimes as early as 10th June. The channel between Owl Island and the North shore of the lake is said never to freeze; and Back's experience proved this to be the case during two winters.

WM. OGILVIE, 1887-88.

As a rule ice clears sufficiently for navigation on Great Slave Lake in the last days in June.

On Lake Athabasca the ice goes a little earlier than on Great Slave Lake.

Ice on the Stikine.

G. M. DAWSON, 1887.

The Stikine is generally open for navigation about the last week in April, and closes about the middle of November.

Ice on Dease Lake.

Ice clears on Dease Lake about first week in June and opens about 1st December.

Ice on the Liard.

G. M. DAWSON, 1887.

At the junction of the Dease and Liard, the latter is free from ice, as a rule, from the first week in May to about the first week in November.

Ice on the Peace.

Prof. MACOUN, 1888 Committee.

Ice first found on the river first week in November, but the river does not close until about a month later. The tributaries close earlier.

The river is open to navigation about the middle of April. Captain Butler found it quite open on April 22nd, 1873.

Ice on the Lewes.

G. M. DAWSON, 1887.

The ice on the rivers opens early in May. Loose ice begins to run on the rivers late in September, and freezes about two weeks later. The lakes on the Lewes are not open until early in June.

Ice on the Yukon.

Mr. W. Sloan, a B. C. merchant and successful Klondike miner, states in the *Financial Times* of 16th September, 1897, that in 1896 the ice finally froze on the Yukon about October 20th, and the river opened on 15th May this year (1897).

H. de Windt, 1897.—The Yukon was blocked with ice in 1896 as early as September 28th.

The Canadian Observatory Authorities state that in 1896 the Yukon River froze up on October 28th, and broke up on May 17th, 1897.

"Mining World," London, 21st August, 1897.

Lieutenant Wilkerson, a member of the United States' engineering corps which has been in Alaska for the past three years . . . states, in answer to the question as to how long during the year the Yukon is open for navigation:—"During the months of July and August only. During the remaining months of the year the ice is from 15 to 30 feet thick. During July and August the ice breaks up, and the river is a mass of floating chunks of ice. Those two months of the year are entirely too short to enable the transportation companies to carry up supplies for any large number of people. . . . ."

Ice on Lake Bennett.

Mr. W. Sloan also states that last year (1896) Lake Bennett was not free for navigation until May 28th.

Ice on the Churchill River.

The Hon. W. Christie, late Chief Inspecting Factor to the Hudson's Bay Company, states in his evidence before the 1888 Committee, that on the River Churchill the ice breaks up about June 28th.

(*See Section* 11 *for distances.*)

Section 13. Restrictions to large Foreign Joint-Stock Companies on the British Yukon.

From Mr. WM. OGILVIE.

CUDAHY, 11th January, 1897.

Fabulous richness; hired help getting £6. 3d. per hr.

Men cannot be got to work for love or money, and development (on the Klondike) is consequently slow;

one-and-a-half dollars per hour is the wage paid the few men who have to work on hire and work as many hours as they like.

Government Mining regulations.

The Yukon mining regulations, issued by the Canadian Government in May this year, state that each miner can only—on personal application—take up a section 100 ft. by 500 ft. (Placer mining); that the Government will reserve every alternate allotment and will charge 10 per cent. royalty on all gold yields up to 500 dollars per week, and 20 per cent. where the yield exceeds this amount.

Expenses present Companies have to face.

In the face of these restrictions there will be but poor encouragement and little opportunity for heavy capitalised English Companies to take up valuable claims on any of the Yukon fields and pay good dividends after all expenses in high wages (at present 6s. per hour), stores, machinery, and from 6d. to 1s. per lb. transport charges have been met.

The Pamphlet issued by the British Development Association, Limited, 1897, states:—

Licenses will only be granted on personal application. Claims must be worked by Licensees themselves.

"The claim must be actually *worked* by the owner. That is to say, no individual or company can take up claims in the names of nominees; and this is very right and proper in the interests of genuine miners. . . .

It is a question how largely capitalised companies can take up more claims than the number of their representatives on the field.

"Some companies formed with the object of taking up claims on the Klondike, have recently come before the public for subscription. It is by no means clear how any of these companies can take up more than one claim, and the Government Authorities have expressed the strongest intention of preventing any evasion of the Mining Laws. Each miner has to pay any an annual Government License of 15 dollars.

Section 14. Climate.

Pro. BELL, M.D., LL.D., Geological Survey, Canada.

Soil only frozen thinly on the surface.

Gave evidence showing that the soil in the Northern Territory thawed out in Summer, and instanced experiments made at York Factory.

General Summary of the 1888 Committee.

The climate of the headwaters of Porcupine and Peel Rivers

That the prevailing South West Summer winds of the country in question bring the warmth and moisture which render possible the far Northern cereal growth, and sensibly affect the climate of the region under consideration as far North as the Arctic Circle and as far East as the Eastern rim of the Mackenzie Basin.

Extract from Leaflet issued by the Canadian Pacific Railway Co.

The climate healthy and agreeable.

The climate is healthy, the winters long and very cold, but so devoid of humidity that their intensity is not so keenly felt as would be imagined from the readings of the thermometer, and with a plentiful supply of suitable clothing can be made agreeable. The summers are short and pleasant with very few rainfalls.

Inspector CONSTANTINE'S Report.

Climate in Mackenzie Bay

The cold is said not to be more intense (in Mackenzie Bay) than here (at Klondike).

Daylight in the N.W. Territories (Actual Sunlight).

W. OGILVIE, 1887-88.

Fort Macpherson,	h. m.	At Ottawa,	h. m.
Lat. 67° 26′, May 1st,	17 30	Lat. 45° 26′,	14 08
,, June 1st,	24 00	,,	15 16
,, ,, 21st,	24 00	,,	15 30
,, July 1st,	24 00	,,	15 24
,, Aug. 1st,	19 24	,,	14 32
,, ,, 31st,	14 44	,,	13 08

Mean Temperature at Fort Franklin, Great Bear Lake, Lat. 65° 12'.

OGILVIE, 1887-88.

During May, 35° ·2 Fah.
„ June, 51° ·4 „
„ July, 52° ·0 „
„ Aug., 50° ·6 „

On two occasions the thermometer went to 78° in the shade and ten times to 70°.

When I (Ogilvie) arrived at Fort Macpherson on 20th June the new buds on the trees were just perceptible, and on the evening of the 22nd the trees were almost fully in leaf.

The mean minimum temperature for month of July was 45° ·4 F.

Small Snowfall on the Mackenzie.

The Hon. Wm. Christie stated in his evidence before the 1888 Committee that the snowfall on the Mackenzie is not so deep. He stated that he found the snowfall much greater in Ontario—as he approached Ottawa—than on the Mackenzie at Fort Simpson.

The Open Sea at the Mouth of the Mackenzie.

Prof. McCOUN'S Evidence, 1888 Committee.

Question—Do you mention that (the drift of Mackenzie River waters to the eastward in the Arctic Ocean) as evidence that there is open navigation from the mouth of the Mackenzie to Behring's Strait?

The sea route to the mouth of the Mackenzie River via Behring Strait

Answer—I believe there is, and the reason is very simple. We can get the records from Point Barrow, where the Americans have an observatory for three years. The full reports from that observatory are published. The reason I think there is no obstruction, and that we have a clear coast, is that the drift is to the eastward. . . . .

Proofs of a long period of open sea in the Arctic Ocean north of the Mackenzie Basin Territory.

I am prepared to prove that the mild climate of the north-west is not an occasional or accidental thing, but that it is permanent, and that the drift of warm air from both sides of the continent seems to come up the Mackenzie River. The isothermal lines show that. The rivers in which Sir John Richardson found the timber coming down, were near the mouth of the Mackenzie River, so that I am quite sure mentally that the rush of heated air keeps the Arctic Sea open. We have hot air passing from the American desert to the mouth of the Mackenzie. The American desert is the source of the blizzards in Dakota—the source of the good climate we have in the north-west territories, and the bad climate they have in the States.

Important Changes in the Climate.

Evidence of Mr. JAMES ANDERSON. Quoting from the Diaries of his Father, the Explorer, before the 1888 Committee.

The mildness of the N. W. Territory climate due to the movement of the Magnetic Pole westward.

Question :—Have not some voyageurs found out that when they get North of the Magnetic Pole the cold is not more intense ?

Answer :—I do not know that, but from these Diaries I find out that right up near the Arctic Ocean in that new country that was explored there, a great deal of it was as mild as at Fort Simpson in 1862.

Question :—The cold is not stationary. It has been discovered that it has been gradually moving to the Westward (towards Alaska and Northern Siberia) ?

Answer :—Yes ; that is the case.

Question :—We (the Committee) all know that the East Coast of Greenland, within the memory of man, was fertile, and at one time the Queen of Norway used to get her supply of butter made there, though the climate has, since that time, become so cold that butter making has been abandoned. Would that not show that if the Magnetic Pole does move westward the climate changes westward with it ?

. . . .

Answer :—There is no doubt that the climate is changing, and we have evidence of it in the prairies of the North West. It is getting milder all the time.

Section 15. Indians and Esquimaux.

The Indian population is sparse, and the Indians, never having lived in large communities are peaceable, and their general character and habits as given by witnesses justify a hope that the development of the country, as in the case of the Indians of British Columbia may be aided by them. . . . .

The Indians are peaceable and likely to aid development.

Extract from the Report by R. G. McCONNELL, B.A.

Friendly Eskimo and Indians (Loncheux) in the neighbourhood of the mouth of the Mackenzie River.

Employment of Indians : their numbers.

The Indians of the Lower Mackenzie are more industrious than those of the Upper Region, and might be utilized with great advantage to themselves and economy to the employer in opening up the coal and petroleum fields of the Territory.

Numbers of Indians and Esquimaux in the far N. W.

In his evidence to the 1888 Senate Committee, Bishop Clut stated that there were 20,000 Indians (not including Esquimaux), in the Mackenzie Basin; about 14,000 of these were Chipewyan Indians.

The Esquimaux might number 1,000 but he could not say, nor, he believed, could anyone else.

Trading with the Indians.

Barter the system of trade with the Indians in the N.W. Territories.

Mr. Caspar Whitney in his book *On Snow-shoes to the Barren Grounds*, published 1896 (p. 162) referring to the matter of trading with the Indians of the far northwest of Canada, states:—"There is, of course, no money in the country, a 'made beaver skin' being the standard of value by which all trade is conducted—as, for example, a marten is worth from two to three beaver skins, and a bear-pelt about twenty beaver skins. A 'made beaver' is a full grown dressed beaver skin, and its value on rough calculation is equal to about fifty cents, though it fluctuates through the country.

The business of the Hudson Bay Company much the same now in the N.W. Territories as in the days of Prince Rupert.

(P. 11.) "Except that goods are now much cheaper and furs much dearer, the fur-trading business of the Hudson's Bay Company is conducted at its inland posts on much the same lines that prevailed when the company was first established."

Section 16. Fish (freshwater) and Game.

Evidence of J. B. HURLBERT, M.D., LL.D.

Fowl plentiful in Mackenzie Bay

The Arctic explorers found fowl so plentiful there that they say you could not throw a stone without hitting a goose or duck

Evidence of DONALD McIVOR.

White and grey wavey, crane, swan, geese and ducks in great numbers. Feathers in great quantities turned out of this district every year by the Hudson Bay Company. Birds.

General Summary of the 1888 Committee.

Of the fresh water fishes of the region Back's "Grayling" are excellent species not prevalent elsewhere, seems to be found everywhere in its rivers and even west of the Rocky Mountains, but the staple product of its lakes and large rivers seems to be white fish of great weight, and trout often reaching 40 lbs. in weight, and evidence goes to show that the farther north the greater the yield of fish till the quantity becomes enormous. Fish—the farther North the greater the yield.

From the Hon. J. SCHULTZ.

. . . . . we have possessed north of the isotherm mentioned perhaps the greatest extent of fresh water food fish . . . . . of any country in the world . . . . . the vast space between the isotherm mentioned and our Canadian Arctic littoral is unsurpassed, not only by the quantity but the quality of its fresh water food fishes, and it will not be to you who have doubtless made the matter a study, a surprise, to find that the quantity increases as we approach the Arctic Coast. The quantity and quality of fresh water food fish unsurpassed in the world.

Canadian Pacific Railway Company's Leaflet, 1897.

The Yukon basin is an incomparable game country, an important factor to the miners in a land were provisions naturally command high prices. The upper portion abounds in moose, cariboo, bear and small game, and the rivers and smaller streams are alive with salmon, whitefish, trout and other species. The lower country is the breeding ground of innumerable geese, ducks, swans and other fowl. A great game country. Game, Fish and Fowl in abundance.

Evidence of Mr. FRANK OLIVER, Editor of the "Edmonton Gazette," to Select Committee of 1888.

Waterfowl plentiful beyond conception.

Waterfowl are plentiful beyond conception in the northern lakes of the Mackenzie Lake and on the Arctic coast in the Summer season, and furnish abundance of food to the Indians while they remain.

Fish abound in all the lakes of running water, and the fisheries of Lake Athabasca, Lake Slave, and Great Bear Lake are at least as valuable as those of the St. Lawrence Chain, while thousands of smaller lakes, especially east of the Mackenzie, are stocked with fish as well. The available fish supply alone is more than sufficient to supply ten times the present population of the Mackenzie region.

Section 17. Corn, Vegetables and Pasturage.

(*See also Section* 25.)

Evidence of Bishop CLUT,

Corn and vegetables grown within the Arctic Circle

Wheat, barley, and potatoes, grow well at Fort Simpson, Lat. 62½. Captain Smith, of steamer "Wrigley," states that he saw barley, wheat, and potatoes, growing as far north as Fort Good Hope, on the Mackenzie, north of the Arctic Circle.

Evidence of J. B. HURLBERT, M.D., LL.D.

Excellent pasturage on the Mackenzie.

The entire area (of the Mackenzie valley) is fit for pasturage, as the native grasses grow over the whole country, even to the shores of the Hudson Bay and Arctic Ocean and down the Mackenzie to the sea.

Dr. DAWSON, 16th August, 1897.

. . . The Hudson's Bay Company many years ago occupied several forts or trading stations in the Yukon country and ascertained by experiment that barley could actually be grown at Fort Yukon within the Arctic Circle and some distance north of the Klondike. (Barley and potatoes are also grown at Fort Good Hope on the Mackenzie).

Barley and Potatoes grown on the Yukon and near the mouth of the Mackenzie.

Professor Bell states in his evidence before the 1888 Committee that wheat ripens well at Norway House and around Little Playgreen Lake. Barley ripens at Oxford House, as far north as Fort Providence, . . . and I have seen excellent wheat ripen at Lake la Biche, where it is said to be a sure crop every year.

Growth of wheat and barley beyond the 60° Lat.

In the country I traversed between the North Saskatchewan and Lake la Biche the grasses were the most luxuriant I ever saw, being often six feet high.

Sir J. Richardson places the northern limit of the profitable cultivation of wheat in the Mackenzie Valley at Fort Liard on the Liard River (lat. 60° 5′) while from trustworthy information obtained by Prof. Macoun it appears that even at Fort Simpson, on the Mackenzie River in Lat. 61° 51′ wheat succeeds four times out of five, and barley always ripens from the 12th to the 20th of August.

In the region of the Peace River Valley there are about 15,140,000 acres of cultivable land, capable of producing over 300,000,000 bushels of wheat.

Section 18. Difficulties of Routes from the South.

(See also Section 27.)

From the Special Correspondent of the "Pall Mall Gazette," 7th October, 1897.

The favourite route so far.

The favourite route so far has been by the Chilcoot Pass, from Dyea Inlet, on the arm of the Pacific, known as the Lynn Canal. Nine miles from the head of canoe navigation, and 15 miles from salt water, this Pass reaches a height of 3,600 feet; the grade of the last six miles is nearly 550 feet per mile, along a very rough and rocky road, which is subject to heavy storms from the winds blowing up from the sea. On the other side the descent is not so abrupt, though it is steep. Although this Pass has been the most used up to the present, it cannot be made into a waggon road for bearing traffic, and is almost impassable for horses. The miners carry their outfit and supplies in packs on their backs. At Dyea, it may be remarked, there is no harbour or anchorage. Vessels cannot come near the shore, and are exposed to the violent winds that blow up the inlet. In case of storms they have to take refuge on the Skagway River, three miles south, which is, therefore, gaining in favour as a landing place.

Not possible for heavy traffic and impassable for horses.

No anchorage at Dyea. . . the Skagway the favorite landing place.

At Skagway there is a wharf and deep water, where cargo may be discharged at any stage of the tides. From this point the way lies by the White Pass, which is thought easier than the Chilcoot, and is 2,600 feet high, as against 3,600. For six miles along the river flats there is a waggon road, and then there is a well marked trail to the summit, ascending by the canyon of the western fork of the Skagway River. Three miles of it is through a box canyon, with a precipice at the upper end, which must be ascended with the aid of ropes. The grade at the latter part of the ascent to the top of the Pass varies from 150 to 300 feet to the mile. From the summit the promoters of this route claim that there is

A precipice to be ascended by ropes on this route.

a good road, but this is hardly borne out by the experiences of prospectors. Perhaps the most convincing evidence of the dangers of this route is that given by the experience of Assistant Commissioner M'Ilree, of the Dominion Mounted Police, who was ordered to lead a detachment over the Pass to the Klondyke, to assist in preserving order.

Four miles in nine days—74 pack horses killed the first day the pass was opened after repairs.

A private letter from one of the Mounted Police now *en route* to the Yukon says, that it took nine days to make four miles, that the boat building party were all more or less sick and very thin, and had sent back for more medicine, as their stock had run out. They were wet all the time, and it rained steadily. 74 pack horses were killed the first day the Pass opened after repairs.

Trees to be hewn down and boats built.

At Bennett Lake the Chilcoot and Skagway routes unite, but the pioneer is still over 500 miles from the Klondyke, most of which, however, can be done by canoe or boat. The adventurer has to carry his craft with him in sections, or hew down trees and build it when he reaches the lakes, which means a delay of several days, as suitable timber is not easy to obtain. A small stream connects Lakes Bennett and Tagish, and the voyagers are carried by a strong current down to the head of the latter very quickly. From Lake Tagish they drift down to another small lake, named Lake Marsh, a long shallow body of water. After this the real difficulties of the journey by water begin.

Sunken boulders make the river dangerous.

The Hootalinqua at times a Mill-race.

White Horse Rapids may, however, be avoided by portage—*i. e.*, by carrying the boat overland till the fall is passed—but this is naturally a long and toilsome business, as the rapids are three-quarters of a mile long. Lake La Barge, which is 85 miles long and 10 wide, is traversed without difficulty, and is connected by Thirty-mile River with the Hootalinqua, a tributary of the Lewes, which at its junction with the Pelly River forms the Yukon. Thirty-mile River is very rapid, and has sunken boulders that make it dangerous if caution is not exercised. The Hootalinqua, too, at times, runs a mill-

race, and in one day voyagers have drifted to within four miles of Five Finger Rapids, a distance of 125 miles. Five Finger Rapids are said to be more dangerous than Miles Rapids described above, but they may be run by a practised hand. In running rapids everything depends upon skill and experience. Those without these gifts had better take to the more laborious method of portaging. After Five Finger Rapids are passed, the voyage offers no particular difficulty. The Yukon is one of the greatest rivers on the American continent. In many places it is more than five miles in width, and in others narrower, but deep, and flowing with a strong current. "You cannot by any means go to sleep, and let your boat drift," says the voyager whose experiences were last quoted.

Skill and experience wanted in running rapids.

A multitude of Islands and narrow channels full of drift.

There are a multitude of islands, sometimes four or five abreast of each other, and as many channels, some of which are very deep and clear of drift, while others are shallow or narrow and full of drift. Such channels must be avoided. After leaving the lakes, the current renders it easy to make a daily run of over 100 miles until Dawson City is reached.

Dalton's trail the only possible Winter route.

It is, however, a question whether either the Chilcoot or White Pass will be open in the Winter. A Zubron pioneer, with considerable experience in passing to and fro, says, "The only possible Winter route is by Dalton's Trail (Chilkat Pass), entailing an expense for a year's supplies of at least a 1,000 dollars." A great many pack horses are required for this trail, which probably accounts for its not being used instead of the Chilcoot and White routes. It is said to be free from heavy ascents and easy to traverse, but only a few have attempted it, so that it cannot be said to have borne the test of experience. The Lynn Canal is left by the Chilkat Inlet, a long and narrow arm of the sea. At the head of the inlet there is a small but good harbour, with shelter from the strong winds prevailing in this mountainous region, an exceptional advantage on this part of the Pacific Coast. A mile north of the harbour the tidal flats of the

Chilcat River are encountered, and 20 miles up the Indian village of Klukwau is reached, where the Klaheela River enters from the west. The Chilkat and Klaheela are navigable for canoes, and a pack trail follows the Klaheela to its source. Thence almost directly north to Fort Selkirk, where the Pelly and Lewis rivers unite to form the Yukon; or if it is desired to take advantage of water transportation at an earlier stage, the Lewes River may be struck at Five Finger Rapids mentioned above. Dalton, after whom the trail is named, gives the time required as "nine days light, twelve to fourteen with a load;" but prospectors who have used it more recently say three weeks. There is an Indian trail from the Chilkat Pass, traversing the same country a little further east, but of this little is known.

Mr. STUART D. MULKIN'S Evidence.

The Pelly River is navigable from Houle Rapids 25 miles from Pelly Banks Post to its junction (under the name of the Yukon), with the Porcupine River, 1,000 miles without a break; while on the other hand the Lewes River, down which the miners from the West Coast must travel, is broken by numerous rapids and three lakes, out of which the ice does not move until July.

The Mackenzie affords the best means of reaching the new goldfields.

"Westminster Gazette," July 27th, 1897.

"The canoe journey up the Stickine (the overland route from the South) is no child's play' The incessant rains keep the river booming, and make the numerous rapids that it boasts terribly dangerous. In spite of the skill of the Indian boatmen many an adventurer has been drowned in its chilly flood. When the rapids are quite impracticable there is nothing for it but to make a portage. Everything must be unloaded and packed with infinite toil over the slippery trail."

Dangers and difficulties of the Stickine Route.

"Daily Telegraph," July 29th, 1897.

The unsuitableness of the Southern Route.

"Under the most favourable conditions, and supposing that steamboats, canoes, and food supplies were all ready and available, the journey would take from five to eight weeks, and the traveller would reach the gold-diggings just as winter was closing in and mining was, to a great extent, stopped."

(*See also Section* 27.)

Section 19. Canadian sub-Arctic Travelling in Winter.

From the "Westminster Gazette," 27-8-97.

Reindeer feed on twigs and mosses but food must be caught or carried for dogs

Will the Canadians be content to still struggle on with dogs and men harnessed as draught animals to the sledges on which supplies must be distributed in that barren and desolate region, or will they be wise in time and make use of the animal which nature has adapted to the zone of frost and snow exactly as she has adapted the camel to the torrid wastes of burning sand? The tame reindeer has long been the ship of the desert for the fjelds of Northern Norway, and the tundras of Siberia. He should become that of the Arctic wastes of North America. There should be no real difficulty about it. The wild cariboo of North America is none other than the reindeer of the Eur-Asiatic Continent. The countless herds of cariboo on which the Indians of the Hudson Bay Territory chiefly rely for a subsistence, afford proof positive that the country contains abundant supplies of the reindeer's natural food. What remains is to introduce the tame variety of the species, whether from Lapland or Siberia, and to make use of it for food and for transport, exactly as is done and has been done from time immemorial by the Lapps and by the

Why not Reindeer for America in the Far North as in Northern Europe and Asia?

Samoyedes. The great objection to men and dogs as draught animals is not that they do not pull well. The difficulty is that neither men nor dogs can live on moss and twigs. Their food must be hauled for them, or rather they must haul it for themselves. An average dog requires a pound of meat biscuit or of pemmican a day, and an average man fully two pounds weight of equally concentrated food. In a few weeks either the one or the other is bound to consume all that he has been able to bring with him from the starting-point. But the reindeer is all right if only he can find lichen and browse. His native home is in the great lone land, where men and dogs alike must starve if they cannot carry with them or kill enough to keep them alive. That bold explorer Mr. Frederick Jackson was so struck by the advantages of the reindeer employed by the Samoyedes when he wintered in the Yalmal peninsular, that he has taken them with him to Franz-Josef Land.

What dogs require.

What Reindeer require.

"Daily News," 30th August, 1897:—

There is a new field also, it seems, for the reindeer. A writer in the *New York Nation* states the interesting fact that five hundred have been imported from Siberia into the Lower Yukon region, and with them a number of Lapland families to care for them. Already the number has been doubled in the natural manner, and an experiment is being made of using them for transportation in the mining country. Should these be successful the future of the dog in these regions will, it is to be feared, be more or less behind him. Unlike the dog the reindeer needs no food carried for him. After an eighty mile drive he can be turned loose to forage for himself upon the abundant reindeer moss which covers all the Alaskan fields. When it is necessary to kill him, he furnishes better meat than the dog and more of it, and every portion of him is of value. "The reindeer express up the Yukon will be," says the same authority, "almost as fleet and more sure than the steam-cars could be during the inclemency of an Alaskan winter."

1,000 Reindeer already in Alaska. A problem solved.

More fleet than steam-cars and more reliable

Dog-Trains for the Yukon.

"Pall Mall Gazette," *October 9th*, 1897.

From its Special Correspondent at Vancouver, 25th September, 1897.

With the dog-trains the Canadian Government hopes to keep communication open all the Winter between Dyea and Dawson. The dogs, as we see them here, are no ordinary animals. They have been bred and trained for the especial purpose of hauling supplies through a rough country. They weigh on an average 80 lbs., and have long hair. They are harnessed to a toboggan sleigh in single file, usually four to a sleigh. One such team will draw a load of 500 lbs. over the roughest country; and, if conditions are at all favorable, will make 60 miles a day.

Dogs can draw about 125 lbs each 60 miles a day over rough country.

"Evening Standard," 17th October, 1897.

From Special Correspondent, *Montreal, October 5th*, 1897.

The Hon. Clifford Sifton, Canadian Minister of the Interior, has reached the Pacific Coast on his way to the Yukon country. He is accompanied by . . . and Major Walsh commanding a detachment of 20 of the N.W. Mounted Police. These, with Indian runners and sledge-drivers with 120 dogs will make the journey from Lake Tagish to Dawson City (600 miles) along the frozen lakes and rivers of the route.

Prices and Particulars of Dogs.

"Newcastle Weekly Leader," 4th September, 1897.

Dogs are so much used for transporting supplies to miners that in Washington and Oregon they have actually become more valuable than horses. . . .

High prices for good dogs.

At Juneau their value is double what it is at Tacoma, and on the Yukon a good dog brings from £25 to £40.

Dog-teams slide over frozen lakes drawing heavy loads with surprising rapidity.

Up to May, when the ice breaks up, dog-teams slide over the smooth surface of the frozen lakes with surprising rapidity considering the loads they carry.

Their food consists principally of fish caught in the Yukon by the natives. An ordinary dog will eat daily two pounds of dried salmon, which equals seven pounds of fresh fish.

At Forty-Mile last winter (1896) dried salmon sold at fron 10d. to 2s. per pound, and bacon, that was only fit for dogs to eat, sold for 1s. 7d. per pound.

A good dog weighs between 80 and 90 pounds.

Dog's boarding houses.

In some of the larger Yukon camps dogs' boarding-houses house and feed dogs at from 25s. to £3 per month according to the season and price of fish.

Mocassins and pack-saddles for dogs.

Buckskin mocassins, after the pattern of a child's stocking, are often provided to keep the animal's feet from being worn raw by the ice and snow.

Pack-saddles for dogs, so arranged that dogs can carry from 10 to 20 pounds each as well as draw a sled, are coming into use.

Dogs will be needed on the Yukon in large numbers for years to come.

River Travel in Winter.

In the *Strand Magazine* for October, 1897, Mr. Harry de Windt supplies a photograph of a team of dogs drawing a sleigh along the ice of a frozen river, which appears very level, with a few inches of snow upon it. He represents this method as the means by which the rivers are traversed in Alaska in Winter.

Reindeer Transport.

"Canadian Gazette," October 7th, 1897.

Reindeer for the Yukon River.

Secretary Bliss is, says a Washington item, taking a great deal of interest in different propositions to extend aid to the miners in the Yukon regions who are apt to suffer this winter from lack of food. He directed the Commissioner of Education, on September 21st, to send instructions to the Teller Reindeer Station to have all

the reindeer, which are trained to draw sledges, sent to St. Michael. Here they will be kept during the winter, and if occasion should arise they can be utilised to transport provisions to the Klondike. Reindeer will draw 300 pounds of food, and travel from 50 to 100 miles a day.

River Travelling on the Yukon.

"Tablet," October 9th, 1897.

The following extract is taken from a long interview, in the *Baltimore Sun*, with the celebrated Father Barnum, who, for some years, has been engaged in missionary work in North-West Alaska.

Cheerful prospect travelling along frozen rivers 60 and 70 degrees below zero.

"He was at St. Michael getting his winter supplies when I arrived, and spoke as cheerfully of 60 and 70 degrees below zero, and travelling by a dog-sledge over icy rivers from one district to another, as a man who contemplated some pleasant scene."

Traversing the highways of the N. W. Territories.

Mr. Casper Whitney, in his work *On Snow-shoes to the Barren Grounds* (p. 303), states that—"Waterways are the highways in the country for canoes in summer and for snow-shoes and sledges in winter."

Section 20. Population of the Future.

Dr. DAWSON, 16th August, 1897.

The whole territory will soon be largely populated.

A considerable population will become resident in the Yukon district, and railways will be provided to connect it with the Canadian system. . . . It

Railways from the South-East

required only the discovery of these rich far northern goldfields to induce the miners to investigate the whole territory, and this will now follow very rapidly.

Briefly stated, I should say that the placer mining now fairly begun on the Klondike is likely to continue for a number of years, the maximum output being attained next year or the year after. Meanwhile the whole country will be filled with prospectors. . . . . The very general distribution of fine gold along the rivers of the whole district, with the geological structure of the country so far as this is known, go to show that other rich placer mining districts will undoubtedly be discovered. Each of these will have a similar history, but in the meantime quartz will be discovered.

The whole country will be filled with Prospectors . . . . settlement will become permanent through discovery of quartz reefs.

"Financial Guide," 9th August, 1897.

"In a few years time, in all human probability, the country that is now ice and snow will be transformed by the magic influence of gold. There is no reason to doubt—nay, it is almost an absolute certainty—that the history of the past in California, in Australia, and in South Africa, will be the history of the future in British Columbia. One difference is sure to be noted, which is that the Yukon district may be expected to prove far richer than any goldfield in California, or Australia, or South Africa."

The country now ice and snow will be soon magically transformed.

New York Correspondent of the "Daily Mail," states:—

"Mr. John W. Mackay, the Bonanza King, and president of the Commercial Cable Company, says:—'I am sure the Klondike goldfields are enormously rich. Capital will fly there and open up the country, and enable vast fortunes to be made.'"

The Bonanza King prophesies the rapid opening up of the country.

Evidence of the Hon. WM. CHRISTIE to 1888 Senate Committee.

Question:—I suppose the Peace River country is a considerable size—in fact there is enough land there to make a new Province?

Agriculture on the Peace River.

Answer:—Yes, I sometimes hear the opinion expressed that our country may ere long become over populated, but there is not the slightest danger of that.

You need not be afraid how many immigrants come into the country to settle. You may bring in all the immigrants Europe can send you. There is room for all in the Saskatchewan and Peace River country. There is a vast extent of splendid country from Prince Albert on the whole north side of the Saskatchewan, going away up until near Fort Pitt, keeping a little to the north. Then when you come to the route of Green Lake, there is two days' journey through a magnificent country, beautifully timbered, well watered, and supplied with abundance of fish. As I travelled through it, I remarked to one of my men, "what a splendid country to settle in."

A vast extent of splendid country.

The "Rush" of '98 to alter the face of the Country.

Mr. de WINDT in the "Strand" of October, 1897.

As to the great Klondike "rush" next spring (1898), there is no doubt it will alter the face of the entire region, the climate notwithstanding. Railways and steamships and telegraphs will soon be established. Fortunes will be made and the unlucky forced to the wall. Sensational reports may be expected daily, for the place is a real Tom Tiddler's ground, honey-combed by rivers and creeks with sands of gold. There is plenty of room for all between Klondike and the Cassiar.

New Comers must go far Afield.

From the "Daily Chronicle" Special Correspondent.

DAILY CHRONICLE, 11*th October*, 1897.

The only way now to share the riches of the Klondike district is to buy an interest in one of the existing claims and for this much capital is needed. Prices are enormous, running from £40 to £100 cash per lineal foot. No man with less than £5,000 to £10,000 can hope to buy himself into a good property, and much larger sums are needed to acquire a substantial share. During the past year prospecting has been vigorously carried on,

but no new strikes of any importance have been made, though there have been numerous stampedes, and many claims have been staked out to Hunker, Henderson and Dominion Creeks.

The only chance for the thousands of new comers who are now pouring into the country is either to work at the mines for wages or to prospect in new and unexplored ground.

Section 21. Present and Prospective Routes to the Gold Fields.

(See also Sections 10 *and* 11.*)*

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1. St. Michael's Route.
   From Norton Sound at the entrance to Behring Strait, up the Yukon River.
   (*See* Section 11 for distances).
2. The Chilkoot Pass Route (identical with the Taiya)
3. The Chilkat Pass Route
4. The Taiya Pass Route
5. The White Pass Route

   See Sections 10 (parts R, S, T and V), 18, & 27 for description, and Section 11 for distances.

6. Behring Strait to Mouth of Mackenzie River.
   This route is only possible during little more than three months in the Summer, while the sea is free from ice. It is, at present, only used by whalers from San Francisco.
   (*See* Section 11 for distances, and Sections 5, 8, 9, 14, 24 and 25 for description, and other particulars bearing on this route.)

7. The Mackenzie River Route.

From the "Chronicle" Special Correspondent:—

London, Daily Chronicle, 16*th Sept.*, 1897.

One of the Trails *via* Edmonton. This is the route taken by the Hudson Bay Company's men. It follows the Peace River eventually into the Mackenzie and thence there is a carry of about 70 miles to the waters of the Porcupine River. . . . . The route is down the Porcupine to its junction with the Yukon. But this is 300 miles below Dawson, with a stiff current against one. The intention is to turn to the southward, and by a trail to be cut of not more than 125 miles, to strike the headwaters of the Klondike.

Edmonton Route, via the Mackenzie River.

"Evening Standard" October 7th, 1897.

From its Special Correspondent.

A route via the mouth of the Mackenzie River.

Still another route, which is claimed to be easier, though it is a long way round, is from the Canadian Pacific Railroad station at Edmonton, in the North-West Territories, by way of the Mackenzie River and Fort Macpherson. Bishop Clut, of Mackenzie River, strongly recommends it. "It may take longer," he says, "but the difficulties the prospectors will have to overcome will be certainly very much less than in going through the Passes from Dyea on the Pacific coast." The McDougall Pass, by which the mountains are crossed, is only twelve hundred feet high, and almost the whole of the rest of the distance can be done by canoe. The half-breeds of St. Albert have formed an association of competent guides, and several prospectors have taken this route, in view of the high prices charged for transportation of supplies over the passes from Dyea inlet. From Edmonton the adventurers travel ninety miles by waggon-road to Athabasca Landing, then by canoe down the Athabasca River to Grand Rapids, one hundred and forty-five miles. Several small rapids which are encountered in succession are easily portaged, and Fort McMurray, on Athabasca Lake, is reached

Route broken by Rapids and a 90 mile road

without difficulty. From there they proceed down the Great Slave River to Smith's Landing, where there is a portage of fourteen miles by ox-cart to Fort Smith. The south-west shore of Great Slave Lake is skirted for some one hundred and twenty miles, which will bring the party to the Mackenzie River, and on down to Fort Macpherson. The distance from Fort Smith to Fort Macpherson is one thousand two hundred and eighty miles, all down stream. From Fort Macpherson the adventurers proceed down the Peel River, fifteen miles to Rat River, where a succession of portages will be made with the aid of Indian guides. The Porcupine River is then descended to the Yukon River, three hundred miles from Fort Macpherson. They then ascend the Yukon two hundred and sixty miles to Dawson City; the distance traversed from Edmonton is two thousand four hundred and fifty-eight miles, two thousand one hundred and eighty-two of which is down stream. The Government are surveying this route, but there seems no doubt of its practicability. It has been frequently used by hunters and traders, and Mr. Ogilvie, of the Dominion Survey, who knows more of the Klondyke than any other man, travelled by it some years ago.

Several portages.

Distance from the Canadian Pacific Railway to Klondyke—2,458 miles.

(*See* Section 11 for distances, and Sections 10, 12, 14, 19 and 22 for description and other particulars. *See* also Route No. 14 further on.)

NOTE.—It is more than likely that some of the large rivers running into the Mackenzie from the West, notably the Peace, Liard and, particularly, the Cacajou, will be utilised as waterways into the goldbearing regions of the Far North West in the near future.

8. THE PEACE RIVER ROUTE.

(*See* Section 11 for distances, and Section 10, part M, for particulars).

9. THE LIARD RIVER ROUTE.

(*See* Section 11 for distances on the Pelly after leaving the Liard River, and Section 10, part K,

for description and distances on the Liard, Frances Lake and Overland to the Pelly).

10. The Stikine River Route *via* Teslin Lake.
(*See* Section 11 for distances after leaving Teslin Lake, and Section 10, part N. for distances on Lower Stikine, and descriptive particulars.)

11. The Taku River Route *via* Teslin Lake.
(*See* Section 11 for distances from Teslin Lake, and Section 10, part W, for distances from Inlet to Lake, and other particulars.)

12. Bound's Overland Route.
Across Chilkat Pass to the Lewes River at Five Finger Rapids. It is to the east of Dalton's trail, and about 180 miles from Pass to Rapids. This trail is, also, said to extend to Link Rapids, on the Yukon. It is reported to be an easy route for horses in the Summer season.

13. Dalton's Overland Route.
From Chilkat Pass to the mouth of the Nordenskiold River on the Lewes; distance about 170 miles. Though this distance is taken from the Pass, Dalton's actual trail begins at Chilkat Inlet, passes to the west of Chilkat Pass, and while occasionally touching the river at the point above-mentioned, it passes at no great distance from the Lewes right on to Fort Selkirk. Dalton will not permit anyone to accompany him on this route.

14. The Edmonton Routes.
There are at least three routes proposed from Edmonton to which place there is a branch of the Canadian Pacific Railway. They are—

(*a*) The route mentioned in this Section, 1st paragraph under the heading—"Mackenzie River Route," Route 7.

(*b*) A proposed Branch of the Canadian Pacific Railway from Edmonton to the Athabasca

River, thence by Athabasca Lake and Slave River to the Great Slave Lake. (There are 14 miles of broken water on the Slave River, and 70 miles on the Athabasca. Mr. McConnell and Bishop Clut 1888 Report). From these Lakes the Mackenzie River and its Tributaries offer means referred to elsewhere, under sections 10, 11, 12, 19 and 22, of getting across the mountains into the Upper Yukon Country. (*See part headed—"The most likely Route from Edmonton to the Yukon."*)

Of all the routes from the Mackenzie, those from near its mouth down the Peel or Porcupine Rivers appear to be the easiest, best known, and least expensive, for about three or four months in the year.

(c) The third route from Edmonton may be termed rather "a large order" for a railway at this stage of the development of the Far North West, but it has the merit of being an easy though long route overland.

The following evidence by Stuart D. Mulkins, Esq., to the Select Committee of the Senate of the Dominion in 1888, describes this route, and supplies distances:—

Fort Saskatchewan, 27th February, 1888.

Having seen by the public prints that you intend during the present session of Parliament to call for a Committee of the Senate to take evidence and obtain information with regard to the extreme North West, and the best mode of obtaining access thereto, I take the liberty of sending you some information collected from persons who have travelled through the Rocky Mountain region, and also a suggestion as to a cheap and serviceable route. The recent discoveries of gold on the headwaters of the Yukon

River have added importance to that country, and if Canada intends to enjoy the benefit to be derived from them, an easy route must be devised which will enable the miners to enter with sufficient supplies to enable them to work during at least two seasons, and such route must commence and run through our territory.

A waggon road starting from here or Edmonton to the Head of Pelly River, the main branch of the Yukon, would fill the bill and bring under 800 miles in length, of which 180 miles is already completed, and 200 miles may be classed as light prairie, and the balance (360) light timber—that is, openings and bluffs. This route would run to the Athabasca Landing (90 miles of road built), thence to Lesser Slave Lake post (160 miles), thence to Peace River (90 miles of road built), thence to Fort Halkett, on the Liard River (200 miles), thence to the head of Pelly River (200 miles). The distance sounds long, but from the information I have obtained it seems that in no part of the whole distance is the timber heavy, muskegs are few and short, and all agree that the road is quite practicable.

The advantages of such a route are obvious. When it crossed the Peace River and Liard River it would give command of those rivers, and in fact the whole of the Mackenzie River basin, without having to pass the dangerous rapids on the Athabasca River, and the long traverse across the Great Slave Lake.

It would also be the cheapest route to the miner going to the Yukon or the Cassier mines; in fact, valuable mines exist on the Liard that have been worked more or less ever since 1873. The miner going to the Yukon would be able to reach the mining ground a month earlier than he possibly could by the Pacific Coast route.

Other routes from Edmonton are referred to by the Hon. C. H. Mackintosh, Lieut.-Governor of the N.W. Territories, when interviewed by a correspondent of the *Pall Mall Gazette*. He stated—

"Pall Mall Gazette," Sept. 16, 1897.

"The other route (after mentioning that of the Stikine), also through British Territory, and for most of its length a waterway, starts from Edmonton. Thence you strike N.W. until you come to Dunvegan on the Peace River, which will carry you into the Mackenzie. Effecting, at times, a portage at Fort Macpherson, you will find yourself in the Porcupine River, which will take you into the Yukon, close to Fort Yukon.

"As an alternative, you can follow Mr. Moberly's route from Edmonton. You first make Tête Jeune Cache, where you light on the North Western water stretches. After negotiating Giscome Portage, the Parsnip River helps you on a bit, when Lake Francis becomes your objective. Then you get on to the Pelly River, a tributary of the Yukon. The distance is, approximately, 1,590 miles, a shorter route, but one which seems to involve a good deal of cross-country work. Still, the Hudson Bay Co.'s people have travelled up and down these lines for a good many years. So you see it is quite possible to reach the Klondike without either a journey of 5,000 miles *via* St. Michael, or a troublesome bit of work over the Chilkoot Pass."

All-Canadian Routes.

"Canadian Gazette," October 7th, 1897.

Mr. John A. Grose, of the Dominion Burglary Guarantee Company, leaves Montreal about December 1st for Klondike, travelling overland from Edmonton. He will not, however, follow the Mackenzie River. He will do his travelling by sledge, and will use either dogs or ponies. The route followed will be: from Edmonton to Peace River Crossing, 260 miles; down the Peace River to

A route largely overland. The Mackenzie route has only one short land break.

Nelson Forks, 240 miles; from Nelson Forks to the Liard River, 120 miles; along the Liard to the Dease River, 160 miles; from the Dease River to the Pelly River, 170 miles; down the Pelly to the junction with the Lewes, 220 miles, and from there to the Klondike, 200 miles, making a total distance of 1,370 miles. This route is considerably shorter than by way of the Mackenzie River.

A party going *via* Mackenzie, *all down stream.*

Another Canadian party, of Hamilton, of which Mr. A. H. H. Heming, artist, is at the head, leaves Hamilton early in April. The trip will be, from Edmonton, 2,458 miles to the goldfields, of which 2,182 miles are down stream. It will take just two months from the time of starting to reach the goldfields, and this will leave the members of the expedition two months, or, at the least, a month and a-half to prepare themselves for the hardships of the winter. The cost will, it is claimed, be just about half of the ordinary expense. The number is limited to 100.

The most likely Route from Edmonton to the Yukon.

Mr. Roger Pocock contributes the following to *Lloyds' Weekly* of 14th November, 1897:—A party of Mounted Police, under Inspector Moodie, has been sent with horses to examine an overland route, still largely unexplored, from Edmonton to the Pelly River, which enters the Yukon 172 miles above Dawson City. By the courtesy of the Mounted Police Department I am able to reproduce here the hitherto unpublished information collected for Inspector Moodie from all sources available. Should his report be favourable the Canadian Government will open the route for travel:—

	MILES.
Edmonton to Old Fort Assiniboine (abandoned), on Athabasca River by old cart trail. Cross Athabasca River	75
Fort Assiniboine to West end Lesser Slave Lake by old Hudson's Bay Company's trail; when last heard of in very bad condition and often very swampy	135

	MILES.
Lesser Slave Lake to Peace River at the mouth of Smoky; cart road. Cross Peace River ...	65
By fairly good trail, in part already passable for carts, to Fort St. John, up the Peace River	145
Fort St. John on Peace River in a N.W. direction. No trail practicable for loaded animals. From Mr. Ogilvie's report classified—for difficulty of road construction—as medium, to mouth of Nelson River on the Liard	270
Cross Nelson River, say 10 miles above mouth; Nelson River up Liard, crossing Toad River easy (to advanced basis of supplies per water route)	40
Cross Liard River and follow the bank of Grand Canyon (over 1,000 feet climb) difficult ...	20
Grand Canyon, following north bank of Liard, crossing Deer, Smith, Coal, and Macpherson Rivers, 100 miles medium, 30 miles easy to mouth of Dease River, which flows in from the Cassiar mining country to the S. W. ...	135
Dease River northward up east bank of Liard, and the Francis tributary to latitude 60° 30′ N.	40
Thence northward, medium	20
Thence northward to lower end of Frances Lake, one of the higher sources of the Liard, crossing one river, easy	25
Cross Frances River at lower end of Frances Lake and up west side of lake, and strike Finlayson River above its Canyon. Medium 20 miles, difficult 5 miles. Crossing the divide between the Yukon and Mackenzie River systems ...	25
Along Finlayson River and Lake, &c., to Pelly River, following on bank, say 30 miles easy, 12 miles medium	42
Cross Pelly River and follow down on bank to Hoole Canyon easy	30
Hoole Canyon is the highest point to which Pelly River might be navigated by steamers of light draught and good power at favourable stages of water, to site of Fort Selkirk, where there	

	MILES.
is a trading post, and where the confluence of Pelly and Lewes Rivers forms the Yukon, 270 miles following bends of river. Following the bank of Pelly by trail striking across to Macmillan valley from the detour, striking that river 20 miles above its mouth, Ross and Macmillan Rivers must be crossed. A few miles here and there would be difficult. Other long stretches easy—classed medium ...	175
Fort Selkirk down the Yukon to Dawson City ...	172
Edmonton to Dawson	1,414

As a means of reaching the Klondike this long, overland trail of 1,067 miles from the plains is not so good as the short portage of 150 miles from the Stickeen to Lake Teslin, with its equally short run by boat down the Yukon; but as a way for sending in cattle Inspector Moodie's route will probably afford better feed than the Dalton. Dawson City is not, however, the main objective for most travellers. The objective is gold, and that is not to be found in an overcrowded camp like the Klondike.

(See also under Route 7.)

15. The Churchill Route from Hudson's Bay.

This route is by a railway which The Chartered Hudson's Bay and Pacific Railway Co. proposes to build from Churchill Harbor. It is proposed to divide the line into three sections:—

a. From Port Churchill to Sea Falls, 350 miles, where it would be joined by the line at present under construction from Winnipeg.

b. Section two, from Sea Falls to Prince Albert, about 300 miles.

c. From Prince Albert *via* Battleford to Edmonton about 350 miles; this would connect with the Canadian Pacific Company's line.

The value of this line, so far as the Yukon gold-fields are concerned, lies in its connection at Edmonton with the routes to the Yukon Valley and Mackenzie River proposed from that place.

In the event of a route being constructed from Edmonton to the Yukon, this Churchill line would prove an easy and very direct means of reaching the Far North West from England. The distance from Liverpool to Churchill Harbor is only 2,926 miles, whereas from Liverpool to New York it is 3,040 miles, and to Montreal 2,990. But it is also necessary to note that from Winnipeg to Liverpool *via* Montreal it is 570 more by land than by this proposed Churchill route.

16. THE OLD HUDSON BAY ROUTE FROM YORK FACTORY AT THE MOUTH OF THE NELSON, HUDSON BAY, TO THE MACKENZIE RIVER.

Evidence of the Hon. Wm. CHRISTIE, late Inspecting Chief Factor of the Hudson Bay Co., to the 1888 Committee.

An old route via Hudson's Bay.

Supplies were shipped from England to York Factory, on Hudson Bay. The route from there was up Hayes and Hill Rivers, and through the lakes up to Norway House, at the north end of Lake Winnipeg, on Jack River. Then through Lake Winnipeg, up the Saskatchewan, past the Grand Rapid, on to Portage La Loche, on to the head of Navigation.

U.S. American *v.* British Territory routes to the Yukon goldfields.

"Manchester Courier," August 4th, 1897.

Present Pacific Coast routes; back-door entrance for our American cousins.

It (the establishment of routes through American Territories to the Yukon goldfields) seems to establish a back-door entrance for the special convenience of our American cousins. There is certainly scope in the district for the energies of both Britisher and Yankee, and there is no desire on the part of this country to "play a Yukon for a Behring." All the same, the back-door arrangement must be regarded as unsatisfactory in view of the possibility of making a front-door which would

be at least 2,000 miles nearer England than the circuitous route by way of Vancouver Island and Juneau. This possibility has been indicated in a memorial from the people of Winnipeg, drawing attention to the advantages for direct water communication with Klondyke which are offered by the great chain of lakes and rivers extending all the way from Manitoba to the mouth of the Mackenzie River, which, although it falls into the Arctic Ocean, is within comparatively easy hail of the more easterly districts into which the gold discoveries are rapidly being extended. Lake Athabasca, Slave River, Great Slave Lake, and the Mackenzie River are navigable during at least four months of the year, and in order to reach the chain from England it would not be necessary to proceed to Winnipeg in the first instance. Thirteen years ago the commander of the naval expedition, which was despatched by the British Government to ascertain the feasibility of establishing regular steamship communication between this country and the western shores of Hudson's Bay, reported that the straits are perfectly free of ice, every year, from the beginning of June to the end of October. He also called attention to the suggestive fact that the distance between England and Fort Churchill, on this coast, is actually less than the distance between Liverpool and New York. There seems to be every probability that the whole of the 1,300 miles' length of the Rocky Mountain range, which extends northwards through British America, will prove to be quite as rich in minerals as the United States portion. It has been tapped at both ends with dazzling results. The quartz reefs to which the Klondyke deposits are being traced prove to be even richer than the mines of British Columbia. Before the great intermediate portion of the range can be explored, advantage will certainly have to be taken of the means of water carriage offered by the great chain of rivers and lakes which is such a conspicuous feature in the map of the North-West Territories. The country traversed by it has a much milder climate than that of Alaska, and is abundantly fertile in parts. Wheat is said to grow well in the valley

A preferable route, *via* the Mackenzie River.

The route *via* Hudson's Bay, the Great Slave Lake and Mackenzie River.

The Klondike gold deposits traced to the Rocky Mountains between the Yukon and the Mackenzie.

of the Mackenzie River, even as far north as the neighbourhood of the Arctic Circle, and many other crops can be brought to maturity during the brief but hot summer of that little-known region. Thus one of the chief difficulties experienced at Klondyke would be solved by the opening of a British front-door to that region, at the same time that the development of the whole of the North-West Territories would receive the stimulus that is alone needed to bring its immense natural resources within the range of British enterprise, and thus open up new markets for British trade.

A British front-door to the new goldfields by a route from the East across the North-West Territories.

17. The Chesterfield Inlet and Mackenzie River Route.—This proposed route is the most attractive to English commercial interests.

(*See Section* 22, *next page*.)

Another Route from Mackenzie River to the Stewart Headwaters.

The *Calgary Herald* of 16th September, 1897, contains the following paragraph concerning an important expedition that has left for the Yukon. "Messrs. B. Pilon, J. Lamoreaux, Louis Lamoreaux, E. St. Jean and M. Verrault, of Fort Saskatchewan, left Edmonton about July 15th. They built a boat at Athabasca Landing, and got away from there about August 1st. Mr. Pilon had gone to the Yukon, by the Mackenzie route some years before.

On this occasion he intended to reach a river which comes into the Mackenzie from the mountains near Fort Wrigley.

A river from the Stewart Headwaters to Fort Wrigley on the Mackenzie.

During his former trip he had heard from Indians who had come down that river, that they had been west of the mountains to a river where the white men were mining gold. This he supposed to be the Stewart River. He proposed to winter as far up the tributary of the Mackenzie as possible, and make across to the river west of the mountains either during the winter or in spring. If this was found impracticable he would take the Peel River route to the Yukon.

Several parties had already started down the Mackenzie to traverse the Peel River route.

A popular route from Calgary is down the Mackenzie and Peel Rivers.

Section 22. The Chesterfield Inlet Route.

It is proposed to build a railway from the river at the head of this Inlet to Great Slave Lake, a distance of 175 miles (this distance is covered for a considerable distance, if not all the way, by navigable waterways), through fairly easy country. The Mackenzie River, navigable for steamers drawing 5 ft. to 6 ft. from four to five months in the year, would then be available. This scheme also allows for a 50 mile railway line from the mouth of the Mackenzie to the Porcupine River, a navigable tributary of the Yukon.

The *Financial News* of July 30th and August 28th refers to this route rather favourably, as also does the *Financial Times* of August 16th. Its advantages are many and should appeal strongly to English views.

a. It would bring the Yukon Territory within nearly two weeks' distance from Liverpool.

b. The time in reaching the Territory from England by this proposed route would be shorter than than that of the shortest route from Vancouver.

c. As almost all the route would be by deep navigable waters and railway, passengers and goods from England would reach the North West Territory quicker and cheaper than by any routes proposed from the West Coast.

d. It would open up the highly mineralised but undeveloped (for want of railways) country of the Mackenzie Basin, especially the vast salt, coal and petroleum areas which are known to be immense.

e. It would develop the fisheries of the Arctic Coast, especially in whaling and sealing, and also the highly lucrative salmon and cod industries.

f. It would open up the great fur countries of the North West Territories and wide areas of good pasture country in the South.

g. The Great Barren North Lands of the North West Territory of Canada are full of rich possibilities in minerals, furs and fisheries, of which explorers speak so highly, and this route would open them up.

The Shortest route from Europe to the Yukon Country.

The "Leeds Mercury," 31st July, 1897.

What the Yukon gold discoveries will open up.

The opening up of the Alaskan goldfields, like those of California, Australia, and every other great gold-bearing country, may, or will almost certainly, be followed by consequences much more important and far reaching than the addition to the world's stock of the precious metal, which is certain to accrue even upon the most moderate estimates of the richness of the Yukon Valley placers. A glance at the map of the Dominion will illustrate our meaning; here we have a country equal in area to the Continent of Europe—of untold capacity to support human life; containing geological formations which have been proved to be an untapped storehouse of all the useful metals and minerals, with dense forests of the noblest species of pine, and immense tracts of land capable of cultivation, with the widest hunting-grounds for fur-bearing animals on the face of the globe, and an inexhaustible food supply of fish and flesh capable of feeding the present population of the empire—all broken up by extensive seas, lakes, and rivers navigable for many months of the year for thousands and thousands of miles. The Dominion Government, long cognisant of the potentialities of the North-Western Territories, but handicapped with an already completed railway system more than half the mileage of which is still unproductive, and all of which is capitalised much above its value, has considered many projects for constructing

Here we have a country of untold capacity.

Railway links to join the lakes and navigable rivers between Hudson Bay and the Mackenzie.

the railway links required to join the lakes and the navigable rivers between Hudson's Bay and the lordly Mackenzie; but until now the time has never seemed opportune, nor has the public mind been awakened to the advantage. A glance at the map shows that the two routes to Klondike, specified in the Emigration Office circular, though the only ones now feasible, are by no means the only ones possible; the shortest route from the United Kingdom to Alaska would be, when the northern seas are open to navigation in summer, from

The shortest route from Europe.

Liverpool to Hudson's Strait and Hudson Bay, up Chesterfield Inlet, across country some 200 miles to the Great Slave Lake, and then down the Mackenzie and Porcupine rivers to the Yukon—a highway for commerce aligned by the distribution of land and water that may be of imperial import in the future.

London to Klondyke in a fortnight.

"Financial News," 28th August, 1897.

Part of an old scheme for opening up the North-West Territories.

A writer in the *Toronto Globe* explains the position in respect to the project for opening up a transit route from the Canadian Pacific Railroad at the nearest point in Ontario to Hudson Bay, and thence to the Mackenzie and Yukon Basins (*via* Chesterfield Inlet). This scheme, joined to the better steamer service between Canada and

Dawson City brought within fourteen days of London.

Great Britain, might not impossibly bring Dawson City within fourteen days of London. As regards the route within the limits of Ontario. . . . . The demonstration at Spithead Jubilee Naval display . . . . showing a speed of 32¾ knots, or over 35 miles . . . accomplished by the use of what were termed turbine propellers. What a revolution would this effect if placed on the route between Ontario's seaport and the western end of Chesterfield Inlet! Those 300 miles would then require forty hours of transit time. And here it may be

Main area of Hudson's Bay open all the year.

well to remark that the main area of Hudson Bay is navigable at all seasons of the year. The obstructions of winter ice are confined to near-shore localities. The open season on the Moose River is similar in duration to

that on the St. Mary's River through which most of the commerce of Lake Superior passes. That at Chesterfield Inlet is, of course, shorter; but how far ice-breaking appliances will aid in lengthening the season there is yet to be tested. No reasonable mind, looking back on the improvements which we have witnessed in transit matters in our generation can treat these new ideas as certainly impracticable in advance of actual tests. They should all have a chance for trial, and may evolve valuable results. The best electrical specialists consider 50 miles an hour a proper speed for an electrical line. By a calculation founded upon the foregoing estimates of the same, in connection with possible marine speed, it would appear that the transit time over the new route from Missanabie to the Yukon goldfields would require but ten hours by rail and 140 hours by water, or about seven days from Toronto. This would certainly enable us to compete with the Pacific coast for the trade of that mining district, and render the intermediate sections on the route tributary to us beyond any competition. Leaving the question of quicker transit time out of account, the fact that, owing to the longer reaches of water transit, freight can be conveyed cheaper from Ontario to those north-western regions than by any other route stamps this new avenue of trade for Toronto and for Central and Eastern Canada as offering an opportunity for business enlargement on a broader basis than ever before obtainable. This being the case, will it not be welcomed by all, and party distinctions and business rivalries be subordinated to the attaining of the magnificent possibilities now apparently within our reach?

Ice-breaking appliances to keep the Chesterfield Inlet open.

This new route offers an opportunity for business expansion far broader than before obtainable.

"Finally: Never was there a case like this in the industrial and commercial history of Ontario, where time is such an element of success or failure. The confirmation of the rumors of the wealth to be found in the mines along the Yukon Valley which has been heralded through the press during the last few weeks has electrified the entire civilised world, and the question of the best means of transit to that region is uppermost in all minds.

The geographical situation of intense interest to Canadians.

The geographical situation is one of intense interest to Canadians, because of the fact that the western ocean frontage, parallel to the entire Yukon Valley, is in the territory and under the jurisdiction of another nation, whose citizens have as yet received at least nine-tenths of the Yukon mining prizes hitherto distributed. Already the people of British Columbia are agitating the question of building over 500 miles of railway through a mountainous district to connect the upper waters of the Yukon with a British port of entry on the Pacific; whereas half that length, and probably one-fourth the cost, would connect the same river with the waters which wash the shores of Ontario (in other words, by the opening up of this Chesterfield Inlet route). That the grandest business prize in our country now waits upon the action of these two provinces is too evident to need argument. 'First come first served' is a rule applicable in this case, and the question of how soon communication can be opened with Ontario must decide the direction of millions of commercial value in the near future."

One-fourth the cost is an important feature.

HUDSON'S BAY TO KLONDIKE SCHEME.

New Scheme, supported by Toronto influence, for a connection with the Canadian Pacific.

"Financial News," London, July 30th, 1897.

The greatest interest is taken at Toronto in the ambitious project of establishing rail and water communication between the main line of the Canadian Pacific Railway North of Sault Ste. Marie and the mining regions on the Yukon River. The first link in the proposed route is a railway line northward from Sault Ste. Marie, crossing the Canadian Pacific at Missanabie, reaching James Bay (the southern extension of Hudson's Bay), at the mouth of Moose River, the distance being about 400 miles. Along Hudson Bay, in a north-westerly direction, the stretch of open salt water to Chesterfield Inlet is 1,300 miles. From the head of navigable water on Chesterfield Inlet, it is estimated by the Government

The first link from the Canadian Pacific Railway to the South End of Hudson's Bay.

maps that *175 miles of railway will connect with the Great Slave Lake. Along that lake and down the Mackenzie River to the delta, at its mouth in the Arctic Ocean, there is a stretch of navigable water† 1,400 miles in length. ‡Fifty miles of railway would connect the Mackenzie Delta with the Porcupine River, a tributary of the Yukon. Down these confluent rivers there are 1,500 miles of navigable water to Behring Sea. This is a route about 4,825 miles in length—4,200 miles of navigable water, and 625 miles of railway. With the additional navigable section of the Yukon reached, there would be an available stretch of transportation facilities about 5,500 miles in length. "If thought advisable," the *Toronto Globe* says, "connection could be made with Athabasca Lake and River by the construction of a few miles of railway, thus connecting about 1,200 miles more of navigable water. This is, of course, independent of the Atlantic route to Liverpool by way of Hudson Bay, a feature considered by the promoters. The intention of the promoters is to commence with the section between Missanabie, on the Canadian Pacific Railway, and Hudson Bay, the route along the valley of the Moose River being 240 miles. This, it is claimed, will bring the fishing trade of Hudson Bay, and the mineral and timber wealth along the route, into direct communication with the markets of Ontario."

The Chesterfield Inlet route to open up all the North-West interior

The fishing, timber and mineral industries.

The link between Sault Ste. Marie and Missanabie—160 miles—will perfect this part of the system. The connection with older Ontario and the fish and other trade of the Hudson Bay region are regarded as more available for profitable development than the British grain trade contemplated in the earlier projected route between Winnipeg and Fort Churchill.

British markets.

A large but unexplored river covers the greater part, and perhaps the whole of this distance.

† *This distance is incorrect; it should be* 1,230 *miles.*

‡ *In summer this distance can be covered by boats the whole way, excepting an easy half-mile portage in McDougall's Pass.*

[*E. J. D.*]

TRADE ROUTES FROM THE EAST TO YUKON.

"Financial Times," 16th August, 1897.

In a pamphlet recently issued by the Canadian Department of the Interior regarding the Yukon district, of which there has been so much talk lately, occurs this succinct statement, laid down as a sort of first principle:—

"Difficulty of access to the Yukon Goldfields the great obstacle."

"The great obstacle to the development of the district is the difficulty of access." . . . Yet that the country is far from inaccessible is shown by the fact that nearly 60 years ago it was not unknown to Hudson's Bay Company's servants, while the brigades of boats of that Company penetrated every season the waterways of the "barren lands" to the east of the Yukon district, a region quite as forbidding as the new goldfields. Some of the books of the late R. M. Ballantyne, who was once in the employ of the Hudson's Bay Company, give a vivid picture of life in the far North-West in the early days, and of the manner in which the great continuous waterways were utilised for trade purposes. Indeed, the Hudson's Bay Company had a well-established trading post at the junction of the Yukon and Porcupine Rivers as early as 1847, which must have been regularly communicated with by way of the Mackenzie River, since all supplies were brought from the headquarters of the Company on Hudson's Bay. If, therefore, the Hudson's Bay men could take in supplies and bring out furs from as far West as Fort Yukon in the early days, when they had to be guided by the reports of roving Indians, and had to give a name to every stream they traversed, the difficulty of establishing well-defined trade routes and using them in this day of maps, surveys and exhaustive reports, should not be insuperable. . . . . The one all-important question is: Is the game worth the candle? And that question has not yet been satisfactorily answered, though it doubtless will be before long. The country appears, from pretty reliable reports, to be rich both in alluvial and quartz gold; and if this prove to be true, it will certainly afford a valuable new market for British goods, and a profitable field for the efforts of British traders, since it can produce little but minerals. This

Will not mining enterprise complete what the Hudson Bay Co.'s Officers commenced so well?

The difference between those days and these.

The one all-important question (since answered).

we know, that two American trading companies have, up to the present, found it sufficiently profitable to enable them to run ocean steamers 3,000 miles, connecting with river steamers running a further 1,600 miles. It therefore behoves British traders and capitalists to look into the matter of trade routes for themselves. . . . .

What British traders and capitalists should look to.

Much alluvial gold has undoubtedly been found in the Yukon district, and it is an undoubted fact that there is quartz gold there. It may prove to be the richest gold field the world has ever seen, but it has not yet been proved so. The whole area between Hudson's Bay and the Rocky Mountains may prove to be rich in mineral; coal has been discovered in some parts of it; but little is known about it yet. We also know that Mr. J. B. Tyrrell, of the Canadian Geological Survey, in exploring the shore of Hudson's Bay, discovered at Chesterfield Inlet a similar geological formation to that which has proved rich in gold in the Rainy River and Lake of the Woods' district of the Province of Ontario. Gold has not been found there yet, however. A line of railway from Manitoba to Hudson's Bay has also been projected, and this would give a short outlet to salt water for Manitoba wheat, and furnish a very useful source of revenue to a line of vessels also engaged in the Yukon trade. . . .

The territory between Hudson's Bay and the Yukon.

A promising gold formation found at Chesterfield Inlet.

The Canadian Pacific Railway is considering the advisability of getting into the field by prolonging its Edmonton line 50 miles to the Athabasca River, whence by Athabasca Lake and Slave River it may reach Great Slave Lake. The Hudson's Bay Company has shown that the country may be entered from the east by two different routes, and we learn that a number of Toronto gentlemen have secured a charter for one of these, though they openly confess that they have no present intention of using it, being more keenly interested in a line northward from Sault Ste. Marie, in the Province of Ontario, to Hudson's Bay. They have, however, secured a charter, as we said, for a route by way of Chesterfield Inlet, navigable, we believe, for ocean steamers, thence, by a line of railway 175 miles long,* to Great Slave Lake, from the

The route from Edmonton.

Two different routes from the east.

A charter already secured for a route by way of Chesterfield Inlet.

* *It is quite probable that most of this distance, if not the whole of it, is covered by the great but unexplored river flowing from the West into Aberdeen Lake at the Head of Chesterfield Inlet.* [*E. J. D.*]

head of which steamers can go right to the delta of the Great Mackenzie. Another short railway line (50 miles) over the height of land is said, by explorers, to be practicable, when a further great stretch of navigable water on the Porcupine is reached. But after reaching the Mackenzie there is a shorter route which Mr. Ogilvie reports practicable, namely, up the Liard River, a tributary, and the Dease, also navigable for small steamers, to Lake Teslin, thus striking both the Yukon and northern British Columbia goldfields. The Hudson's Bay people used the Liard, which passes through a break in the Rockies, and the Upper Pelly, but on the latter river there are dangerous rapids which cannot be passed by steamers. At the other end of the route, from Chesterfield Inlet, direct connection may be had, during summer, with Liverpool, which is about 2,800 miles away. Thus by sea, rail and river, a route might be had direct from England to the Klondyke, just about equal in length to that from San Francisco by way of Fort St. Michael and the Yukon River. It should also be a quicker route, a fact which, joined with the advantage in tariff rates enjoyed by the British trader, should give him a strong advantage.

Via the Mackenzie and Porcupine Rivers.

Via the Liard River.

A direct route from Liverpool to the Yukon nearly all by water; 1,200 miles by river down stream.

A magnificent scheme.

The Chesterfield Inlet route a profitable venture.

This last scheme is an ambitious—even a magnificent one, but we are quite willing that anyone who cares to take it up should benefit by our idea. . . . . If the Yukon field do not peter out the establishment of the rail and water line we have mentioned might be a very profitable venture, even if gold or coal were not found East of the Rockies, or the Manitoba wheat traffic tapped immediately; but it all rests on the future of the Yukon district as a gold field. . . . . However, we may say that we think two or three hundred pounds invested in a trading company, in whose promoters a reasonable amount of confidence may be placed, is likely to give quite as good returns as if invested in a ticket to Klondyke, a miner's kit and a "grub-stake," with infinitely less discomfort to the investor.

Section 23. To Chesterfield Inlet from Athabasca Lake.

By J. W. TYRRELL, C.E., D.L.S.

The River Telzoa extending from near Lake Athabasca to navigable waters at Head of Chesterfield Inlet.

After traversing the shore of this great icy lake (Lake Doobaunt, August, 1893), our river (the Telzoa) was again discovered. It was not obstructed by ice, but, as before, its clear, cold waters rushed on to the northward.

About 6 miles further on the river widened into a little lake, and further down the river, on the evening of August 19th, as our little fleet glided down with the strong, swift stream, we sighted an Esquimaux camp.

Lake Whiteaves.

Soon after leaving the Esquimaux camp we discovered a lake, 20 miles long, which has been honoured by the name of Whiteaves. . . . . We found the outlet at the base of a very remarkable mountain of white quartzite. Lady Marjorie Lake was next met with. The course of the river from this lake appeared to be westerly and north-westerly, and this being the opposite direction to that which we were desirous of travelling, we followed it somewhat reluctantly. The whole appearance of the river was different from what it had been higher up. It was now a noble stream, broad, deep and swift, with a well-defined channel and high banks of rock or sand. On and on we were borne in a general north-westerly direction, until we began to doubt the Esquimaux's report regarding the river flowing to Hudson Bay. We had already passed the latitude of Chesterfield Inlet and Baker Lake, and were heading from them straight for the Great Fish River (flowing into Great Slave Lake), which was now distant only two days' travel (something about 55 miles).

A remarkable mountain of white quartzite.

A noble stream, broad and deep.

The Great Fish River only two days' journey away to the West.

On the evening of August 25th a change took place in the character of our surroundings. The river banks became low and composed of soft coarse-grained sand-

stone. . . . . The surprising and most delightful feature of the locality was that upon the shores there was strewn an abundance of driftwood.

A most important river probably connecting Great Slave Lake with Chesterfield Inlet by navigable waters.

At first sight its occurrence was unaccountable, but the mystery was readily solved however by finding that *we had reached the confluence of another large river flowing in from the west.* Much of the driftwood was of large size, and judging from the slightly battered condition one would infer that it had come no very great distance, or at any rate through very few rapids.

Lake Aberdeen a great lake.

From the confluence, the course of the river bore to the north and then to the eastward and ere long brought us to the entrance of a great lake—Lake Aberdeen 50 miles in length. (Mr. Tyrrell mentions himself and companions as the first white men who had ever been on this lake.) On the morning of August 29th we

Schultz Lake

entered the river leading into Schultz Lake, or a few miles distant, lat. 64° 45′.

Only two rapids between Aberdeen Lake and the Inlet; easily navigated even by canoes.

The river leading from Lake Schultz is wellformed and deep. Two rapids were met with but they were not difficult and were easily run. The current was strong and we sped along at the rate of 8 miles an hour. The river continued deep and flowing in a south-easterly direction.

Camps of Esquimaux.

Shortly before the river empties into Baker Lake, we came upon another Esquimo camp, and about ten miles further on we came upon another large camp. One of the

Tents of the very valuable musk-ox skins.

first objects that attracted my attention was a "topick" tent (or "wigwam") constructed of no less than the most beautiful musk-ox robes. At first I felt almost inclined to doubt my own eyes. It seemed such a waste of luxury. . . . . Next my attention was drawn to a pile of skins lying on the rocks, which with the exception of a few white wolf and fox skins consisted of musk-ox robes. . . . . We soon found that we (this Esquimaux camp) were at the mouth of our great river and we passed into the broad delta and gazed over

Baker Lake.

the blue limitless waters . . . of Baker Lake, about 70 miles long and perhaps 30 wide.

From Black Lake at the head of Lake Athabasca to this (Baker) Lake, we had travelled a distance of 810 miles through an entirely unknown country.

From head of Baker Lake to mouth of Chesterfield Inlet, 250 miles.

From this camp at the head of Baker Lake we were to begin a new stage of our journey. According to our maps we were still about 250 miles from the mouth of Chesterfield Inlet. The river from Baker Lake to the "big sea waters" of the Inlet is described by Tyrrell as being more a *fiord* than river and easily navigable.

(The sum of Mr. Tyrrell's journey appears to be that a river route from Athabasca Lake to Chesterfield Inlet is impossible, but that the large but unexplored river entering Aberdeen Lake from the west brings the navigable waters of Chesterfield Inlet very close to those of the Great Slave Lake and probably unites them.)

Section 24. The Sub-Arctic Territory of North Canada.

Evidence of Prof. J. B. HURLBERT, M.D., L.L.D. (1888 Committee).

Prof. Hurlbert describes the flora and fauna of this region.

The barren grounds are to the West of Hudson Bay —from the 60th to 61st parallel to the extremity of the continent (Arctic Ocean). . . . Sir John Richardson describes even these barren grounds as covered with a dense carpet of the cornecularis, tristis and many other plants, a dozen at least, to the shores of the ocean. There are stumps of trees solitary and grouped, the size not named, and clumps of living trees on sheltered banks of rivers. On the sea coast even there is a good growth of grasses, twelve varieties are named, such as elymus mollis, campacta and several poae, varieties of our June grasses and the Kentucky blue grass. Hearne in his two expeditions, 1769-70, to discover Coppermine River, records fine weather from the 6th to the 9th November, and again in December 11th and 12th. He found deer

plentiful; swans, geese and partridges; killed three musk oxen. He gives the following list of animals west of Hudson Bay in the barren grounds:—Foxes plentiful, of various colours which prey upon rabbits, mice and partridges; lynx, polar bear, black and grizzly bear and wolverine as far north as Coppermine River. Otters plentiful to latitude 62, north of Churchill. Jackash, the lesser otter; common marten, ermine or stole, muskrat, porcupine, hares, numerous to latitude 72, Hearne names rabbits in another place. Squirrel plentiful in wooded parts. Ground squirrels plentiful to latitude 71, and large as the American grey squirrel. Mice, frogs and insects in great plenty. In Hudson and Arctic Sea are walrus or sea horse; the whole coast of the Hudson Bay being alive with them. Seals more to the north, sea unicorns in the straits. Black whale, white whale and salmon numerous, some seasons, and kepling, shell fish; birds numerous. Eagles, several kinds, hawks of various sizes and plumage: owls, white, grey and mottled, ravens, American crows. Woodpeckers, grouse, buffalo grouse, sharp tailed grouse, wood partridge, willow partridge, rock partridge, red breasted thrush, grosbeak, snow bunting, lapland finch, larks, titmouse, Hudson Bay black cap, swallows and martens, whooping crane, brown crane, bitterns, curlews, to latitude 72, jacksnipes, red godwits, spotted godwits, sandpipers, plovers, hawk eye, sea pigeons, northern divers, black throated divers, white, grey and black gulls, black heads (gulls), pelicans, goosanders, shell ducks, swans, geese (ten varieties), horned wavies, laughing geese, eider ducks, dunter goose and ducks of various kinds.

Vegetables.—Gooseberries, cranberries, heath berries, currants, red and black, juniper berries, strawberries, eye berries, blueberries, partridge berries. Mosses, grasses of several kinds, Trees: pine, juniper, poplar, creeping birch, willow (dwarf); birch plentiful; pines, larch and poplar. Birch grow to great size further westward. Alder. Sir John Richardson says stumps

of large trees are found and he saw large forests in the distance, but could not at that late season turn aside to examine them. The committee can judge from these statements whether the name "barren ground" is not a misnomer. It should at least be qualified. I know of no region of equal extent in any part of the globe similarly situated which is such a land of desolation as that part of the Dominion has been represented.

Prof. Hurlbert declares the term "barren" as a misnomer.

Interview by the Correspondent of the "Pall Mall Gazette" with the Hon. C. H. MACKINTOSH, Lieut.-Governor of the N.W. Territories.

"PALL MALL GAZETTE," 15*th September*, 1897.

. . . It is a big subject, the North West Territories—a million and a half square miles. But one thing I can say about the country is, that the Territories are an undeveloped treasure-house of the Empire, and when it has been exploited, well! the rest of the world will rub its eyes and wish it had a share in it. . . . Give us a year—or, perhaps, two—and we will astonish the dear old mother country, and make the nations outside the Empire green with envy.

The N.W. Territories the treasure-house of the Empire.

An Important Un-Mapped River.

Mr. JAMES ANDERSON'S Evidence. Quoting his Father, the Explorer, before the 1888 Committee.

The Big Hula Dessi, or Inconnu River, rises near Great Bear Lake, and flows into the Arctic Ocean, one branch into Liverpool Bay and the other a little to the Eastward of Esquimaux Bay. Several rivers fall into it. Where it divides to form the two branches it is as broad as the Mackenzie, at Fort Simpson. The waters are very clear and deep, and it is navigable from the source to the mouth. Birch and pine of good size at the forks. On the banks of the river marten, otter, foxes, bear, wolves and wolverines abound; also moose, reindeer, musk oxen, the latter all over the country. Fish abound in the river and adjacent lakes.

Means of opening up the Far North West by means of waterways from the Arctic Ocean. Resources of the Territory.

The ice is said to break on this river earlier even than the Mackenzie. Enters the sea about Long. 120°; Lat. of its source about 64 or 65. Tar and sulphur springs abound. Veins of fine white earth at the forks and along the river.

Extracts from the Explorer Anderson's Diary.

Evidence of Mr. JAMES ANDERSON, speaking chiefly from the Diary of his Father, who was appointed by the Home Government in 1855 to go in search of Sir John Franklin.

Important notes from the diary of an explorer.

This diary mentions gooseberry trees in blossom and strawberry plants in flower at Great Slave Lake during the first week in June.

Potatoes, barley and turnips—potatoes as good as any in Canada—grown at Fort Simpson, lat. 62°.

Ice left the Mackenzie River between Fort Good Hope and Great Slave Lake about the middle of May.

The severity of the climate is not worse than at St. Petersburg, which is on Lat 60°.

The diary mentions Mr. Anderson, Sen., finding large pieces of coal on the Mackenzie River, and seeing plumbago from the Yukon.

The Hudson's Bay Company had cows and oxen at Fort Simpson.

In winter, there are only two or three hours of daylight at Fort Simpson, but in summer one can scarcely tell the difference between night and day.

Produce is grown all along the Churchill River.

Agriculture on the verge of the Barren Grounds.

Evidence of MALCOLM McLEOD, Esq., Q.C., Ex-Judge, to 1888 Senate Committee.

Singular fertility of the N. W. Territories.

There was plenty of good open ground for cultivation at Norway House, but everyone was so busy at more urgent work that no one even tried it. At Oxford House, nearly 150 miles further east, and colder on the height of land—the summit of the Laurentian Range—

there was a fine garden, growing potatoes abundantly; and whereof, *en passant*, I did eat. Here in 1832 forty head of cattle were kept, and a large gang of men supplied from the place while making a winter road between Norway House and York Factory. At York Factory, on a shore we may call Arctic, I saw nice little gardens with turnips, radishes and flowers, many and beautiful. My old friend, Peter Warren Dease, of Arctic fame, and whose son-in-law Bell was for many years in charge of the most northerly Mackenzie River coasts, used to tell me of his (the old gentleman's) fine and successful gardening in the far north. He had a taste in that way, as shown in his ever well trimmed and highly cultivated grounds. To him, as a perfectly reliable authority, I owe much if not most of my very strong conceptions as to the singular fertility of the Mackenzie River Valley.

The Chesterfield Inlet Country.

A large but unmapped river.

Mr. Warburton Pike mentions in his work, "The Barren Grounds of Northern Canada" (p. 204), that when he arrived at Artillery Lake, on the Lockart River, he met an Indian named "Pierre the Fool" (one of the most intelligent Indians in the territory), who gave a great deal of information about the territory East of Clinton Golden Lake, and said that three days' travel East of the Lake there was a large river running in a Southerly direction, and once when he had pushed out further than usual Eastward, he came upon an Esquimaux camp. The Esquimaux had been cutting up pine wood for their sleighs. Mr. Pike states that—"from the fact of his having seen the pine trees, which are said not to extend far from the salt water of Hudson's Bay, he must have been within a short distance of the (Hudson's Bay) Coast."

A short route from Chesterfield Inlet to the Great Slave Lake System.

Section 25. Important Comparison with North Russia.

Evidence of G. M. DAWSON, Director of the Geological Survey of Canada to 1888 Senate Committee.

Similarity of the mouth of the Mackenzie and its Territory to the White Sea and the country about Archangel.

I have a few notes here worth considering while we are dealing with the question of this Northern country, particularly the Yukon. I looked up the circumstances of the Northern Provinces of Russia, and I found, taking the Province of Russia, which seemed to compare most nearly with that shown on this map, both its relation in Russia to the Atlantic corresponding to the relation of this Country with the Pacific and its latitude, that is the Province of Vologda. That Province has a total area of 155,498 square miles, and it is chiefly drained to the North, like the country shown here. It lies between Lat. 58 and 65. It is about 750 miles in greatest length, and 300 miles greatest width. It is drained by the Dwina River chiefly. Its products are carried by this river to Archangel, and exported thence in vessels by the White Sea, in the same way that we hope this Northern country of ours may be served by the Mackenzie and the Arctic Sea. The mouth of the Dwina is in Lat. 65°, only a little South of the latitude of the mouth of the Mackenzie. The climate of the two countries is very similar. The winters are severe and the summers warm. There is no very heavy rainfall, such as we find near the Western coasts bordering on the Atlantic and on the Pacific. The exports from that Province of Vologda are oats, rye, barley, hemp, flax and pulse. The mineral products are salt, copper, iron and marble. Horses and cattle are reared, and the skins of various wild animals, pitch and turpentine are exported. This Province supports a population of 1,161,000 inhabitants.

Dr. Dawson's scheme to make the mouth of the Mackenzie serve the N. W. Territories as the White Sea serves North Russia.

Exports and Products of Russia about the White Sea.

Some Particulars of Archangel.

Position of Archangel corresponding with that of Klondike.

Archangel is on the White Sea, about Lat. 64° 30″ corresponding with that of the Klondyke River. The harbour is only free from ice from July to September,

yet it is a thriving and rising city, with a population of about 25,000. The British Consul's Report for 1896 states that over 25,000 people are engaged in fishing in the district, and 4,500 men employed in the saw-mills. This year, 1896 (the Consul states), Archangel will probably be in telegraphic communication with the whole of the White Sea country or the Lapland Coast of Norway, while the railway from Vologda to Archangel, with a length of 136 miles, will most probably be finished.

Railways of Archangel.

In 1895, 172 steam and 151 sailing vessels entered Archangel. Of the steamers 127 were British. The Consular Report states that the White Sea shipping is fast developing, the number for 1896 being 418 foreign and 309 Russian, exclusive of 1,132 coasters. Imports are also increasing.

Increase of shipping in the White Sea.

There are 1,946 miles of railways already constructed in Finland.

Populous towns in Sub-Arctic Europe and Asia.

"Birmingham Gazette," 31st August, 1897.

Although Klondyke is called a desolate region, it must not be assumed that it is quite as hopeless as some of the papers paint it. As a matter of fact, the climate of the Yukon Valley is much the same as that of the Russian province, in Europe, of Vologva, which has a population of a million and a-half, and enormous mining and smelting industries, and also grows a great deal of rye. There are great towns, like Archangel, Kem, Mezen, and Yakutsk, which flourish, although their food and means of transport are no better than those of Dawson City will be a couple of years hence. It is also a fact apparently unknown in England that the gold-mines south-west of Lake Baikal, are worked under conditions similar to those that prevail in Klondyke, but in a far more severe climate. From these mines the Czar receives an income of two and a-half millions a

Large populous cities much further north than Klondyke.

year. There is, however, an amazing degree of ignorance in this country concerning Russia and the East. For instance, as late as three years ago one of the leading papers had never heard of the Trans-Siberian Railway, and confounded it with the Trans-Caspian Railway.

The possibilities of the Mackenzie—Yukon Country.

"British Review," July 31st, 1897.

An example of what might be done by establishing a whaling station at the mouth of the Mackenzie.

In the palmy days of the narwhal fishery, the Arctic port of "Smeerenburg" on the Spitzbergen coast at times contained a floating population of ten thousand souls. Here, rough streets of wooden huts gave the hardy followers of the right whale indifferent shelter from the icy blasts, the vilest of spirits to drink, and even the refined society of a large number of ladies from the purlieus of the Dutch and Scandinavian seaports. In these matters the whalers were better off than the fur-traders who have held their little out-posts for commerce in the northern solitudes for three centuries. Starting in the comparative civilisation of Manitoba and Winnipeg, the chain of Hudson Bay Company's forts has extended right up the Mackenzie River to within a short distance of the Polar Ocean and that "North-West Passage" which was not worth discovering. In these isolated block-houses a few hardy Scotch factors contrived to support existence even at a time when it took three years and a-half for goods and letters to reach them from England. But the fur-traders were not settlers or colonists. They were simply sentries or vedettes thrown out by the army of commerce, with instructions to fall back upon the main body when their work was done. The North to them was only the hunting ground for pelts, and the land very much as the sea on which the whalers chased the narwhal to his death.

The Yukon Gold discoveries may open up the Arctic North to great possibilities.

But the gold discoveries of the Yukon region, of which so much has been heard during the last few days, may open another chapter in the history of the sub-Polar world. If the deposits are as rich, or only half or a

quarter as rich as they are represented to be, there will speedily be a great population in the neighbourhood of the Klondike and Dawson City. If that happens, we shall be in face of an interesting, though it may be a rather painful, experiment. For the first time almost in its recorded history, mankind will have tried to hive a large population of civilised human beings under conditions so extraordinarily difficult and trying as those to be found in the glacial regions.

Large towns in Europe further north than Klondike.

There are, of course, towns as far north as the new camps of the Yukon. Many a cheap tripper from Aberdeen or Newcastle has been a good deal nearer the Pole, so far as actual latitude is concerned; for the Norwegian towns, Hammerfest, Tromsö, and Vardo, are in fact further north than Klondike.

(The large city of Archangel on the White Sea is on the same latitude as Dawson City.)

Section 26. Hudson's Bay and its Territory.

Extent and Resources of the Territory.

From the Pamphlet of the Chartered Hudson's Bay and Pacific Railway Company. Prepared by Col. J. HARRIS, F.R.G.S.

N. W. Territories under local government.

The country at present under local government comprises the Province of Manitoba, covering an area of 64,000 square miles, with Winnipeg as its capital, and the three territories of Assiniboia, Saskatchewan, and Alberta, covering an area of 303,000 square miles, with Regina as their capital. The whole of this vast region, extending from about twenty-five miles West from Lake

Area of the Hudson Bay agricultural territory.

Superior to the Rocky Mountains, a distance of 1,350 miles, and from the forty-ninth parallel of latitude North, to the water-shed of the Saskatchewan River, an average distance of 350 miles, embraces an area of 462,500 square miles, or 269,000,000 acres, two-thirds of which has been proved to be capable of producing the finest wheat, and the rest admirably adapted for stock raising and dairy farming. The whole of this region, including a great portion of the States of Minnesota and North Dakota, in the United States, is drained by the lakes and tributary streams of the Nelson River, into Hudson's Bay, in latitude 53 North. It comprises the richest and most extensive undeveloped wheat-producing lands in the world, and access to which, from the United Kingdom, by ordinary steamers *viâ* Hudson's Bay can be reached within eight days.

Agricultural returns

Dominion Government Returns of 1895 give these figures for the Province of Manitoba :—

Product.	Acreage.	Bushels.	Average yield.
Wheat	1,140,276	31,775,038	27·8 bushels
Oats	482,658	22,555,733	46·7 ,,
Barley	153,839	5,645,036	36·7 ,,
Potatoes	16,716	4,042,562	243·5 ,,
Pease	—	28,229	—
Flax	82,668	1,281,354	—
Rye	—	81,082	—

Value of live-stock, grain, and dairy produce in Canada.

During 1892 there was imported into the United Kingdom from Canada 101,426 heads of cattle, besides a large number of horses and sheep, and, including grain and dairy produce, was valued at 10,000,000 sterling. The shipment of cattle bred on the ranches of Alberta to Great Britain continues to increase, and the superior quality of these animals has excited the most favourable comments of buyers in England, and more than two-thirds of the total increase in the shipment of live stock took place from the North-West Territories.

Territory under cultivation.

"During 1891 there were under cultivation in the Province of Manitoba, and the three territories of

Assiniboia, Saskatchewan, and Alberta, 1,300,000 acres, which produced twenty-five million bushels of wheat and thirty million bushels of barley and oats, whilst the number of cattle was estimated at about 600,000 head."

THE HUDSON'S BAY SEA ROUTE.

Exports and Cost of Transport.

Cost of wheat and live-stock exportation; saving by a Hudson Bay route.

The present cost of transporting wheat to the seaports at Montreal, Boston, or New York, from the centre of this region is about thirty-five cents per bushel, whilst the same charge per mile to Port Churchill would not exceed fifteen cents, and to the ports further north in the Bay—Chesterfield Inlet for example—the charge would be proportionately less, and the saving in the carriage of live stock, as stated by Admiral Markham, would be fully equal to £3 per head.

Exports at present restricted by distance.

One of the most important questions of the day is the importation of live stock into the United Kingdom. Here is a country capable of raising millions of heads of cattle, absolutely free from every kind of disease, owing to the remarkable healthfulness of the climate; but the present export is prohibited, owing to their having to pass for more than 1,000 miles through the Eastern portion of Canada to a port of shipment. The opening of a Hudson's Bay route would remedy all this, and would enable the cattle to be shipped in prime condition at half the present cost by way of Montreal.

Hudson Bay.

Proceedings of the Royal Geographical Society, October, 1881, on the Commercial Importance of Hudson's Bay, with Remarks on Recent Surveys and Investigations, by ROBERT BELL, M.D., F.G.S., Assistant Director of the Geological Survey of Canada.

Dr. Bell's knowledge of Hudson's Bay.

I beg leave to offer to the Royal Geographical Society a few remarks on the great Mediterranean Sea of North America, in regard to which there appears to be a general want of correct information. Before proceeding to do so, it may be proper for me to state that I have con-

siderable personal knowledge of Hudson Bay and the surrounding regions. As an officer of the Geological Survey of Canada, I have spent six seasons since 1869 in explorations around the bay itself or in its vicinity, while the remaining summers of this interval have been devoted mostly to surveying and exploring portions of the Hudson's Bay territory at greater or less distances inland. . . . . In the popular mind, Hudson's Bay is apt to be associated with the Polar Regions, yet no part of it comes within the Arctic circle, and the Southern extremity is South of the latitude of London.

Including its Southern prolongation of James' Bay, it (Hudson's Bay) measures about 1,000 miles in length, and it is more than 600 miles in width at its Northern part.

Navigation of the Bay.

Hudson's Bay and Straits remarkably free from obstructions.

. . . . Both the bay and straits are remarkably free from rocks and shoals which might interfere with their free navigation. The groups of islands near the east side of the bay are surrounded by deep water, and a wide channel leads up the centre of James's Bay. Fortunately the main body of the bay, which is the portion likely to be hereafter frequented by shipping, is entirely without shoals, reefs, or islands. The depth is very uniform over most of the bay, and nowhere does it present any great irregularities. It averages about 70 fathoms throughout, deepening to 100 and upwards in approaching the outlet of Hudson's Strait; while in the strait itself the soundings along the centre vary from about 150 to upwards of 300 fathoms. The bottom appears to consist almost everywhere of boulder clay and mud. Near the shores a stiff clay, affording good holding ground for anchors, is almost invariably met with on both sides.

The Bay uniform in depth and affording good anchorages near shore.

Navigation of rivers flowing into Hudson's Bay.

Few of the rivers of Hudson's Bay afford uninterrupted navigation for large vessels to any great distance from the coast. During the season of high water, shallow-draft steamers might ascend the Moose river and two of its branches for upwards of 100 miles. Hayes

river and two of its branches might apparently be navigated by such craft in the spring to points about 140 miles inland, and the Albany for nearly 250 miles; while large steamers might ascend the Nelson for seventy or eighty miles from the open sea. The Churchill, which is the second largest river of Hudson's Bay, is a beautiful clear-water stream, somewhat larger than the Rhine. It is remarkable for having at its mouth a splendid harbour with deep water and every natural convenience for the purposes of modern commerce. (*See part Y, section* 10, *for further references to these rivers, and to the Chesterfield Inlet.*)

Resources of the Hudson's Bay Territory.

The resources of Hudson's Bay and the country immediately around it are varied and numerous, although as yet few of them are at all developed. The fur trade is the principal and best known business which has hitherto been carried on in these regions, but a large amount of oil, derived from the larger whales, the porpoises, walruses, white bears, and the various species of seals which frequent the northern parts of the bay, has been carried to New England, and small quantities, principally of porpoise and seal oil, have from time to time been brought to London by the Hudson's Bay Company. The other exports from the bay have been as yet but trifling. They embrace whalebone, feathers, quills, castorum, lead ore, sawn lumber, ivory, tallow, isinglass, and skins of seals and porpoises. The fisheries proper, speaking of Hudson's Bay, have not yet been investigated. Both the Indians and Eskimo find a variety of fish for their own use, and fine salmon abound in the rivers of Hudson's Strait; and from one or two of them a considerable number of barrels, in a salted condition, are exported every year. Waterfowl are very numerous on both sides of the bay, and larger game on the "barren grounds" in the northern parts, so that the natives, with prudence, may always have a plentiful supply of food.

The resources of Hudson's Bay and Territory varied and numerous.

Besides oil and furs other exports are whalebone, feathers, quills, castorum, lead ore, sawn lumber, ivory, tallow, isinglass and skins, besides salted salmon.

The most important of the undeveloped resources are its soil, timber and minerals.

But perhaps the most important of the undeveloped resources of the country around the bay are its soil, timber, and minerals. To the south and west of James's Bay, in the latitude of Devonshire and Cornwall, there is a large tract, in which much of the land is good and the climate sufficiently favourable for the successful prosecution of stock and dairy farming. A strip of country along the east side of James's Bay may also prove available for these purposes. To the south-west of the wide part of the bay the country is well wooded, and although little or no rock comes to the surface over an immense area, still neither the soil nor the climate is suitable for carrying on agriculture as a principal occupation until we have passed over more than half the distance to Lake Winnipeg. This region, however, offers no engineering difficulties to the construction of a railway from the sea-coast to the better country beyond, and this, at present, is the most important point in reference to it. Some of the timber found in the country which sends its waters into James's Bay may prove to be of value for export. Among the kinds which it produces may be mentioned white, red, and pitch pine, black and white spruce, balsam, larch, white cedar, and white birch. The numerous rivers converging towards the head of James's Bay offer facilities of "driving" timber to points at which it may be shipped by sea-going vessels.

No obstacles to the construction of a railway.

Minerals in the Hudson's Bay Territory.

Mineral to be the greatest resources of the Bay in future.

Minerals may, however, become in the future the greatest of the resources of Hudson's Bay. Little direct search has as yet been made for the valuable minerals of these regions. I have, however, found a large deposit of rich ironstone on the Mottagami river, inexhaustible supplies of good manganiferous iron ore on the islands near the Eastmain coast, and promising quantities of galena around Richmond Gulf and also near Little Whale River, where a small amount had previously been known to exist. I have likewise noted traces of gold, silver, molybdenum, and copper. Lignite is met with on the

Magnificent list of minerals.

Missinabe, gypsum on the Moose, and petroleum-bearing limestone on the Abittibi river. Small quantities of anthracite, and various ornamental stones, and rare minerals, have been met with in the course of my explorations. Soapstone is abundant not far from Mosquito Bay, on the east side, and iron pyrites between Churchill and Marble Island, on the west. Good building stones, clays, and limestones exist on both sides of the bay. A cargo of mica is said to have been taken from Chesterfield Inlet to New York, and valuable deposits of plumbago are reported to occur on the north side of Hudson's Strait. Some capitalists have applied to the Canadian Government for mining rights in the latter region.

The New Importance of Hudson's Bay.

Hudson's Bay now begins to possess a new interest . . . the future highway between the Great North-West and Europe

Situated in the heart of North America, and possessing a seaport in the very centre of the continent, 1,500 miles nearer than Quebec to the fertile lands of the North-West Territories, Hudson's Bay now begins to possess a new interest, not only to the Canadians, but also to the people of Great Britain, from the fact that the future highway between the great North-West of the Dominion and Europe may pass through it. The possibility of this route being adopted for trade is not a new idea, and it has frequently been suggested by far-seeing men in past years, and occasionally referred to in the newspapers. (The discovery of the extensive and enormously rich Goldfields in the Yukon basin adds a new and important interest to Hudson Bay as providing an almost direct route from England to the far North-west. E. J. D.)

"The Archangel of the West."

Sir J. H. Lefroy, President of the Geographical Section of the British Association, in the able address which he delivered at the Swansea meeting (1880), said: "Hudson Bay itself cannot fail at no distant day to challenge more attention. York Factory, which is nearer Liverpool than New York, has been happily called by Professor H. Y. Hind the Archangel of the West."

Agricultural Possibilities.

The Canadian North-West capable of becoming the greatest wheat-field in the world.

It has been shown that the Canadian North-West Territories, embracing hundreds of millions of acres of fine land, are capable of becoming the greatest wheatfield in the world. The centre of this immense agricultural region lies to the north of the Saskatchewan. If we look at the map of the northern hemisphere we shall see at a glance that the shortest route between these territories and England is through Hudson's Bay. Mr. Lindsay Russell, the Surveyor-General of Canada, has recently made a close calculation of relative distances, and found that even the city of Winnipeg, which is near the south-eastern extremity of these territories, is at least 800 miles nearer to Liverpool by the Hudson's Bay route than by the St. Lawrence, while the difference in favour of the former will be increased continually as we advance northward into the interior.

The city of Winnipeg 800 miles nearer Liverpool via Hudson's Bay than by the St. Lawrence.

Advantage in Distance of the Hudson's Bay Route.

A great and important saving to be effected by a Hudson Bay route.

The route from the North-West Territories to England, *via* Hudson's Bay, saves the whole distance between Winnipeg and Montreal. The distance to Liverpool by way of New York is still greater. The advantages of this short route over all others are so numerous that only a few of them can be referred to in this short paper. The great saving in distance represents an important economy in time and money, or in freight and passenger rates. If the grain, cattle, and other productions of the North-West Territories could reach an European market, only through Ontario and Quebec, or by way of New York, a large proportion of their value would necessarily be consumed by the long land carriage; whereas, if they find an outlet at Churchill, there will be an average saving of 1,291 miles as compared with Montreal, and of upwards of 1,700 miles as compared with New York, and this without any increase in the length of the sea voyage. In effect, this will place a great part of the farming lands of our North-West Territories in as good a position in regard to a seaport as

A Hudson Bay route to open up the farming lands of the N. W. Territories.

are those of Ontario, west of Toronto; and consequently will greatly increase the value of every description of farm produce, and, therefore, of the farms themselves. Some kinds, which could not be sent out of the country at all by the longer land route, may be profitably exported by the shorter one. For the transportation of both grain and fresh meat, as Colonel Dennis has pointed out, the northern route, besides the shortening of the distance, would have great advantages over all those to the south, owing to its cooler and more uniform temperature. Heavy or bulky goods of all kinds would, of course, be imported into the North-West by the shortest land route. In regard to the export and import of live stock, this independent route will possess a great importance to these territories. Hitherto, cattle, horses, hogs, and sheep have there enjoyed an immunity from almost all forms of contagious diseases, and, owing to the healthy nature of the climate for these animals, it is hoped this state of things will continue. The domestic animals in the United States and the older Canadian provinces being occasionally afflicted with contagious diseases, it becomes necessary for European countries to impose restrictions on their importation. In the event of an epidemic of this nature existing in some part of these regions, but not in the North-West Territories, there need be no objection to exporting live stock from the latter by way of Hudson's Bay.

Freedom from disease amongst animals in the N. W. Territories; an important advantage in the export trade.

A Passenger Route of National Importance.

As a route for emigrants from Europe, that by Hudson's Bay possesses not only the advantage of the short land journey, but the still more important one to us, of entirely avoiding the United States and the populous parts of Canada, in both of which, it is well known, a very serious percentage of the immigrants destined for our North-West lands are every year enticed away to settle in the great republic. An inlet by Hudson's Bay is the only thoroughly independent channel which can ever be established between the

An all-British passenger route.

British Islands and our great and valuable territories in the interior of North America; and it is very desirable, on national grounds, that it should be opened up.

No Obstructions to Navigation.

The idea of ice destructive to the navigation of Hudson's Bay destined to prove chimerical.

An impression has long prevailed that Hudson's Bay and Strait could not be navigated for the ordinary purposes of commerce on account of ice, but this idea is probably destined to prove chimerical. The occasion for testing the point has not hitherto arisen, and the fact that these waters have been successfully navigated by ordinary sailing vessels for 200 years, in order to secure what little trade the country afforded, indicates what may be expected from properly equipped steamships, so soon as the larger business of the future may require their services in this direction. The conditions of the sea-borne commerce of the North West, in relation to Hudson's Bay, will probably turn out to be similar to those of the rest of Canada with reference to the Gulf of St. Lawrence. In both cases, everything must be done during the summer. Yet Hudson's Bay is, of course, open all the year round. No one would be likely to suppose that a sea of such extent, in the latitude of the British Islands, would ever freeze across. The Lower St. Lawrence is also partly open even in the middle of winter. But the difficulty in both cases is the impossibility of getting into harbours. A harbour such as that of Churchill on Hudson's Bay would have the advantage over Quebec or Montreal of communicating directly with the open sea, and hence in the autumn vessels would not be liable to be frozen in, as occasionally happens in the St. Lawrence.

Hudson's Bay open all the year.

The advantage of a Hudson Bay sea-port over the St. Lawrence.

Period of Open Navigation in the Bay and Rivers.

Hudson's Bay ports open to navigation from middle of June to end of October every year.

There has been some discussion as to the length of time during which Hudson's Strait and Bay might be navigated each year, but there does not seem to be much evidence that the strait, any more than the bay, is closed

at any season. Its great width, depth, and strength of the tides probably keep it open all winter. My own experience and that of many others lead me to believe that the climate generally of Hudson's Bay is much better than some writers have represented it to be. From all that I could learn or observe, it appears that the strait and bay may be navigated and the land approached by steamers during an average of four and a half months each year, or from the middle of June to the end of October. The strait and bay could probably be navigated by steam vessels earlier than the middle of June, but nothing would be gained, except perhaps by whalers, in going in before an open harbour can be reached.

Over 50 years' records of the open navigation period of some of the Hudson's Bay Rivers.

I have a record of the principal phenomena of the seasons at Martin's Falls, on the Albany, extending through a period of fifty years, and from it I find that the river is open there on an average for six months of the year. I have also a record of dates of the opening and closing of Hayes River at York Factory, extending over more than fifty years, from which it appears to enjoy an average of fully six months of open water. The Nelson River is open for a longer period. I think, with these facts before us, we need not despair of successfully navigating Hudson's Bay, as far as the length of the season is concerned. Even were the time of open navigation shorter than it is known to be, the very great benefits which the North-West and Canada generally would derive from possessing an outlet in that direction are sufficient to make it well worth an effort to open it.

Economic Advantages of this Route to Europe.

Navigation of Hudson's Bay exempt from pilots, lighthouses and other charges.

The freedom of Hudson's Strait and Bay from rocks, shoals, and other impediments to navigation will exempt vessels in that quarter of the globe from the heavy expenses for pilots, lighthouses, &c., which burden shipping by the St. Lawrence, and are even more onerous in some other parts of the world. The delays from drifting ice in the strait, which have occasionally occurred to sailing vessels, would not be experienced by steamships.

The increase in land values in the N.W. Territories by the shorter route to Europe for products via Hudson's Bay.

We have seen that in proportion as we decrease the cost of transportation to a foreign market, we increase the home value of all kinds of farm produce, and consequently of the farm itself. Now, considering the vast extent of fine land to be affected by the opening of the route above referred to, if the value of each acre of it were enhanced in this way by only a few shillings, the aggregate increase would amount to more than a hundred million of dollars. Such a gain as this, together with the various other great advantages which, as we have seen, may be derived from the opening of this new ocean route, will, I think, sufficiently illustrate the commercial importance of Hudson's Bay.

Record of Wrecks in Hudson's Bay; Only One in 374 Years.

Hudson's Bay Co. have been navigating the Bay for 147 years.

Dr. Robert Bell obtained from the Company's offices, in London, a record, which, printed in his report, shows the date of arriving and sailing of their vessels at York Factory for 93 years, and at Moose Fort for 147 years. These lists show that in some years several vessels were sent in charge of British men-of-war, and there have been almost every year during the past two centuries ships of various classes and sizes, navigating the strait without loss, and it seems almost incredible that such a number of voyages could be made, extending over 374 years, without the loss of over one, or, as is claimed by some writers, two small sailing vessels.

A marvellous record!

Important Evidence of the Bay's Navigation.

Extracts from the Hudson Bay Committee's Report of 1884.

No evidence has been given that goes to prove that Hudson's Strait and Bay proper ever freeze over, or that the ice met with in those waters is sufficient to prevent navigation at any time of the year.

That, consequently, the period of navigation is defined by the time during which the ports, harbours, or roadsteads on the shores of the bay can be entered by vessels of a suitable description for such navigation.

That, from the evidence adduced, it appears that such ports or harbours are open, on an average, from four and a half to five months in each year to ordinary vessels.

The ports and harbours of Hudson's Bay open from 4½ to 5 months every year.

That Hudson's Bay and Strait appear, from all evidence taken, to be singularly free from obstruction to navigation in the shape of shoals or reefs; and, during the period of open water, from storms or fogs.

Section 27. Dangers of the Chilkat, Taiya Chilkoot, and White Passes.

W. OGILVIE, 1896.

It is said by those familiar with the locality that the storms, which rage in the upper altitudes of the coast range during the greater part of the time, from October to March are terrific. A man caught in one of them runs the risk of losing his life, unless he can reach shelter in a short time. During the summer there is nearly always a wind blowing from the sea up Chatham Strait and Lynn Canal, which lie in almost a straight line with each other, and at the head of Lynn Canal are Chilkat and Chilkoot inlets. The distance from the coast down these channels to the open sea is about 380 miles. The mountains on each side of the water confine the currents of air, and deflect inclined currents in the direction of the axis of the channel, so that there is nearly always a strong wind blowing up the channel. Coming from the sea, this wind is heavily charged with moisture which is precipitated when the air current strikes the mountains and the fall of rain and snow is consequently very heavy.

Terrific storms rage in the region of these Passes.

In Chilkat Inlet there is little shelter for ships.

In Chilkat Inlet there is not much shelter from the south wind, which renders it unsafe for ships calling there. Captain Hunter told me that he would rather visit any other part of the coast than Chilkat.

In the summer months there is nearly always a wind blowing in from the coast; it blows down the lakes (Lindeman, Bennett, etc.,) and produces quite a heavy swell.

Extracts from Mr. H. de WINDT'S Letter in the "Times" of 23rd July, 1897.

The Chilkoot Pass condemned by Mr. de Windt, the explorer.

"The Chilkoot Pass is difficult, even dangerous, to those not possessed of steady nerves. Towards the summit there is a sheer ascent of 1,000 feet, where a slip would certainly be fatal. At this point a dense mist overtook us, but we reached Lake Lindemann—the first of a series of five lakes—in safety after a fatiguing tramp of fourteen consecutive hours through half-melted snow. Here we had to build our own boat, first felling the timber for the purpose. The journey down the lakes occupied ten days, four of which were passed in camp on Lake Bennett during a voilent storm which raised a heavy sea. The rapids followed. One of these latter, 'The Grand Cañon,' is a mile long, and dashes through walls of rock from 50 feet to 100 feet high; six miles below are the 'White Horse Rapids,' a name which many fatal accidents have converted into the 'Miner's Grave.' But snags and rocks are everywhere a fruitful source of danger on this river, and from this rapid, downward, scarcely a day passed that one did not see some cairn or wooden cross marking the last rest resting-place of some drowned pilgrim to the land of gold.

Mr. de Windt's opinion of the Taku route is not shared by Mr. Ogilvie—*See* Section 9, Part W.

"There is, however, a brighter side to this gloomy picture, for there are fortunately other approaches to the Yukon Valley besides the dreaded Chilkoot. The chain of mountains of which the latter forms a part is cut by three other passes—The Taku, the Chilkat, and

the White Pass. Of these the two former may be dismissed as being, on account of their length and other difficulties, almost as impracticable as the Chilkoot, over which it would be quite impossible to lay a bridle path; but the White Pass offers no serious obstacles to the construction of a railway. The White Pass is at least 1,000 feet lower than the Chilkoot, and, unlike the latter, is timbered the entire length. The salt water terminus of this pass is in Skagway Bay, 85 miles from Juneau. Here ocean steamers can run up at all times to a wharf which has been constructed in a sheltered position, and there is an excellent town site with protection from storms. The pass lies through a box cañon surrounded by high granite peaks and is comparatively easy. It has already been used by miners who report very favourably upon the trail, and when it is considered that the adoption of this route obviates the dangers and expenses of the Chilkoot, avoids Lakes Lindemann and Bennett (the stormiest and most perilous of the whole chain), shortens and greatly diminishes the expense of the journey to the Yukon Valley, and, above all, can be used throughout the year (the interior of Alaska is now completely cut off from the world for nine months in the year), there can be little reasonable doubt that the White Pass is the best and most practicable route to the Yukon goldfields."

Mr. de Windt prefers the White Pass.

Interview with Mr. HARRY DE WINDT, "Strand Magazine," October, 1897.

"The tramp from Dyea to Sheep Camp, at the foot of the pass, can be avoided by riding, but the trail is terribly rough. At Sheep Camp we stopped four days, the Indians having struck for higher wages, which we were compelled to give them. Here we passed three parties of miners who were returning to Juneau, having failed through lack of provisions to reach the Lakes. A stiff climb of two hours from Sheep Camp brought us to Stone House, the limit of the tree line; and from here the hard work commenced in grim earnest. For the first

few hours, the way lay over a succession of snowy 'plateaus,' which, broken away beneath by numberless water-courses, formed a kind of crust 15 feet to 20 feet above the ground. The travelling here was extremely dangerous. There was absolutely no path or trail to guide one; and huge crevasses, where the snow had fallen in upon some roaring torrent, appeared here and there. There are seven or eight of these 'plateaus,' which increased in steepness until, midway up the last one, we were scrambling painfully up the slippery ice-slope on our hands and knees. Here a dense mist overtook us, and we lay shivering (at a very uncomfortable angle) for three hours, until it cleared away and disclosed the rocky precipitous peak of the Chilkoot towering another thousand feet above us. The cold was intense, and we were not sorry to resume our journey. The last part of the ascent was terribly hard—in places literally perpendicular. There is no path of any kind, nor would it be possible to make one, for the rocks are loose and insecure, and the passage of a man will often dislodge a huge boulder, and send it crashing down, to the deadly peril of those below. The ascent of the peak occupied nearly three hours. There were two or three places where a slip must have meant certain death, notably one about thirty yards from the summit, which we reached at about 5 a.m.

"I have roughed it," said the explorer to me, "for the past fifteen years in Siberia, in Borneo, and in Chinese Tartary, but I can safely describe that climb over the Chilcoot as the severest physical experience of my life. A blinding snowstorm barred our way for nearly an hour, and we then descended a steep ice-slope of about 500 feet, which brought us to Crater Lake. From here, at 7 a.m., began an exhausting tramp through deep snow-drifts, gradually thawing to half-frozen slush, knee-deep, as we gained the lower ground. A rocky ridge of hills and three small streams were then crossed. One of the latter, swollen by recent rains, carried one of our party off his feet, but he was, with

some difficulty, rescued. From 10 a.m. till midday, heavy and incessant rain fell, but by 2 p.m, we stood dead-beat, bleeding and exhausted (but safe), on the shores of Lake Lindemann, the journey having occupied nearly fifteen hours. Then we had to wait ten hours longer, drenched with rain and perspiration, and sick with hunger, until the Indians came up with provisions."

The head of Lake Lindemann, the first of a chain of five lakes, is about nine miles from the summit of the pass. If you think that, having regard to what you have already endured, all will now be plain sailing, you are greviously mistaken. You must build a boat here, capable of carrying yourself and your stores hundreds of miles across lakes and through rapids. It doesn't matter if you know nothing of boat-building; you *must* build some sort of boat or raft, or else turn back over the awful Chilcoot. "Where is the wood?" you ask, in dismay. You have *to fell the trees for it*—aye, and travel miles to find a tree, so disafforested has this spot been by hundreds of eager gold-seekers. In your baggage should be not merely the tools for tree-felling and plank-sawing, but even the very pitch which is to caulk the seams of your crazy craft.

Leaving the Lakes on June 26th, we entered the Lewes River, and next day reached the Grand Cañon Rapid, which is nearly a mile long, and dashes through perpendicular walls of rock from 50 feet to 100 feet high. The fall is 100 feet wide, and so swift, that the stream is 4 feet higher in the centre than at the sides!

"Next we dashed down a perfect mill-race for six miles to the White Horse Rapids—a place so fatal as to have received the name of the 'Miner's Grave.' Not a day passed that we did not see a cairn, or a rude wooden cross, marking the last resting-place of some drowned pilgrim to the land of gold. At Fort Selkirk, the Lewes River down which we journeyed from the Lakes unites with the Pelly, and the two together form the giant Yukon, which has a course of 2,044 miles.

"On the twenty-fifth day out from Juneau we reached Forty Mile City."

Section 28. General.

Extract from the Summary of the Committee appointed to enquire into the resources for the Great Mackenzie Basin.

Little more known of this territory than of Central Australia and Africa.

Your Committee (of the Senate of the Dominion), desiring to refer briefly to the evidence upon which they have based these conclusions, may explain that very early in their investigations they became convinced that very little more was known of the Northern and Eastern portion of area committed to them for investigation than was known of the interior of Africa and Australia.

A Yukon Outfit.

FROM LUGRIN'S PUBLICATION ISSUED FROM THE OFFICE OF THE AGENT-GENERAL FOR B.C., LONDON.

8 Sacks Flour	1 lb. Pepper
150 lbs. Bacon	10 lbs. Salt
150 lbs. Split Peas	8 lbs. Baking Powder
100 lbs. Beans	40 lbs. Rolled Oats or Oatmeal
25 lbs. Evaporated Apples	2 doz. Yeast Cakes
25 lbs. Evaporated Peaches	½ doz. 4 oz. Beef Extract
25 lbs. Apricots	5 bars Castile Soap
25 lbs. Butter	6 bars Tar Soap
100 lbs. Granulated Sugar	1 tin Matches
1½ doz. Condensed Milk	1 gal. Vinegar
15 lbs. Coffee	1 box Candles
10 lbs. Tea	25 lbs. Evaporated Potatoes

25 lbs. Rice	1 Pie Plate
25 Canvas Sacks	1 Knife and Fork
1 Wash Basin	1 Granite Cup
1 Medicine Chest	1 each Tea and Table Spoon
1 Rubber Sheet	1 14-in. Granite Spoon
1 set Pack Straps	1 Tape Measure
1 Pick	1 1½-in. Chisel
1 Handle	10 lbs. Oakum
1 Drift Pick	10 lbs. Pitch
1 Handle	5 lbs. 20d. Nails
1 Shovel	5 lbs. 10d. Nails
1 Gold Pan	6 lbs. 6d. Nails
1 Axe	200 feet ⅝-in. Rope
1 Whip Saw	1 Single Block
1 Hand Saw	1 Solder Outfit
1 Jack Plane	1 Pair Rowlocks
1 Brace	1 14-qt. Galvanized Pail
4 Bits, assorted, 3/16 to 1 in.	1 Granite Saucepan
1 8-in. Mill File	8 lbs. Candle Wick
1 6-in. Mill File	1 Compass
1 Broad Hatchet	1 Candle Stick
1 2-qt. Galv'd Coffee Pot	6 Towels
1 Fry Pan	1 Axe Handle
1 Package Rivets	1 Axe Stone
1 Draw Knife	1 Emery Stone
3 Cov'd Pails, 4, 6, 8-qt. Granite	1 Sheet-Iron Stove

Some of the foregoing articles are omitted by some miners, but the Dealers of Victoria or Vancouver may be safely trusted to advise intending travellers in the matter of outfits in all cases.

Joe Ladue's food outfit for 12 months.

Mr. Joe Ladue (the pioneer and founder of Dawson City) states in *McClure's Magazine* for September, 1897:—

"Provisions as reasonable at Juneau as anywhere."

"A year's supply of 'grub,' which can be bought as cheaply in Juneau as anywhere, I think, is: 100 sacks of flour, 150 lbs. sugar, 100 lbs. bacon, 30 lbs. coffee,

10 lbs. tea, 100 lbs. beans, 50 lbs. oatmeal, 100 lbs. mixed fruits, 25 lbs. salt, about 10 dollars worth of spices and knick-knacks, and some quinine to break up colds.

No man should go to the Klondike with less than £100 and if possible £1,000.

"The total cost of this outfit is about 200 dollars, but no man should start with less than 500 dollars, and twice that is ten times as good."

Klondike Market Prices, July, 1897.

Summer prices on the Klondyke during the summer of 1897.

Here is a list of prices which obtain at Klondyke just now:—

Flour, per 100 lb. ...	£2 10s. to £24
Beef, per lb.	4s. to 8s.
Bacon, per lb.	3s. 3d.
Moose Hams, each	£6.
Moose Hams, per lb.	8s.
Rice, per lb.	3s.
Tea, per lb.	12s.
Coffee, per lb.	9s.
Butter, per lb.	10s.
Eggs, per lb.	12s.
Potatoes, per lb.	10s.
Tobacco, per lb.	8s.
Canned fruit, per can ...	9s.
Coal oil, per gallon	10s.
Lemons, each	1s.
Oranges, each	2s.
Liquors, per drink	2s.
Miners' picks, each	£1 8s.
Shovels, each ...	£3 8s. to £3 12s.
Shoes, per pair ...	£1 to £1 12s.
Rubber boots, per pair	£2 8s. to £3 12s.

Another Table of Prices.

Cost of outfit, travelling expenses, time and distances, etc., from the United States to the Klondyke.

Here is another table which shows what it will cost to reach the gold fields from New York:—

Fare from New York to Seattle *via* Northern Pacific, £16 6s.

Fee for Pullman sleeper, £4 2s.

Fee for tourist sleeper, run only west of St. Paul, £1.

Meals served in dining car for entire trip, £3 4s.

Meals are served at stations along the route *à la carte*.

Distance from New York to Seattle, 3,290 miles.

Days required to make the journey, about six.

Fare for steamer from Seattle to Juneau, including cabin and meals, £7.

Days, Seattle to Juneau, about five.

Number of miles from Seattle to Juneau, 725.

Cost of living in Juneau, about 12s. per day.

Distance up Lynn Canal to Healey's Store, steamboat, 75 miles.

Number of days New York to Healey's Store, 12.

Cost of complete outfit for overland journey, about £30.

Cost of provisions for one year, about £40.

Cost of dogs, sledge, and outfit, about £30.

Steamer leaves Seattle once a week.

Best time to start is early in the spring.

Total cost of trip, New York to Klondyke, about £133 2s.

Number of days required for journey, New York to Klondyke, 36 to 40.

Total distance, *via* Juneau, to the mines at Klondyke, 4,650 miles.

A Light Weight Outfit.

From "The Review of Reviews," 15th September, 1897.

An old pioneer's outfit.

Joaquin Miller, who may be regarded as an expert capable of reducing his impedimenta to an irreducible minimum, carried with him the following kit:—

"I have twenty pounds of bacon, twelve pounds of hard tack, half pound of tea. I have a heavy pair of blankets, the heaviest; socks, underclothing, boots, a rubber blanket, a macintosh, a pound of assorted nails, one hundred feet of small rope, a sail and an axe. My pack is forty pounds all told. I have a pocket-knife and an iron cup, a thermometer and about 100 dollars.

"I hope to build a raft, carry my own pack over all the places, and travel hastily on ahead and alone. You see, I have spent years alone in the mountains, and have been in almost all the 'stampedes' for the last forty years, and know what I am about."

A well-to-do miner's outfit.

If that be the minimum equipment for a forced march, here is what may be regarded as adequate provision for a well-to-do miner for twelve months in Klondyke. It is an interesting table of the needs of the civilised human when encamped on the rim of the Arctic Circle. The total cost of the outfit only comes to £44:—

A twelve months' Outfit.

Provisions.—75 pounds granulated sugar, 1 dozen packages of beef extract, 10 pounds evaporated onions, 50 pounds evaporated potatoes, 50 pounds evaporated peaches, 10 pounds evaporated currants, 25 pounds salt, 25 pounds rolled oats, 50 pounds cornmeal, 200 pounds breakfast bacon, 50 pounds rice, 1 pound cayenne pepper, 1 pound black pepper, 1 case condensed milk, 10 sacks flour, 1 bottle vinegar, 15 pounds dried beef, 1 case baking powder, 1 pound mustard, 1 box candles, 1 can matches, 20 bars soap, crackers, Castile soap, 1 dozen small cheeses, 25 pounds spaghetti, 15 pounds coffee, 3 pounds tea, 100 pounds beans, 25 pounds of pitted plums. Total cost of provisions at Seattle, £21.

CLOTHING.—Three suits underwear, one undershirt, one Yukon blanket, one summer blanket, one dozen pairs socks, two pairs mittens, one cap, one bag, two overshirts, one jumper, one pair gum boot socks, two pairs rubber boots, two pairs leather shoes, hobnailed. Total £15 6s. 4d.

TOOLS AND COOKING UTENSILS.—40 pounds wire nails, 5 pounds pitch (for caulking boat), 1 whip saw, 1 caulking chisel, 2 pounds tallow (for caulking boat), 2 wedges, 1 handsaw, 250 feet ⅝-inch manilla rope, 1 compass, 1 knife and sheath, 1 pack strap, 1 brace, 1 shovel, 1 pick and handle, 2 buckets, 1 coffee-pot, hooks and lines, 1 stove, 1 piece sheet-iron, 1 revolver, belt and cartridges, 1 gold pan. Total £8 5s.

Besides these supplies each traveller has a case of medicine that costs 38s.

To get to Klondyke with supplies for a year it is estimated the miner should have a capital of from £200 to £250.

Fares and Time, Liverpool to the Klondyke.

TIME.—Liverpool to Montreal, about 10 days, Montreal to Victoria, 5 days.

FARES.—Liverpool to Victoria (steam and rail), 1st, £24 12s. 7d.; 2nd, £17 18s. 9d.; 3rd, £15 18s. 9d.

The Canadian Pacific Navigation Company, book passengers from Victoria (B.C.) right through to the gold-fields, *via* St. Michael's, for £30 16s. 6d. Total cost, cheapest fare from Liverpool to Dawson City, £46 15s. 3d.

Next year, 1898, fares from Victoria to the gold-fields will probably be much cheaper.

The time from Victoria (B.C.) to the Yukon varies according to circumstances, 2 to 6 weeks. If by St. Michael's and the Yukon, according to delays at ports and on the river, and obstructions on the latter; if overland and by the Lewes River, according to luck and the individual. (*See Sections 10, 18 and 27.*)

How a Miner "peg's out" on the Yukon.

Mr. Joe Ladue states in *McClure's Magazine* for September, 1897 :—

This is how a miner is enabled to "read his title clear" to the patch of auriferous soil which he wishes to claim :—

How to obtain a clear title to a claim on the Klondyke.

Claims have to be staked out, of course, according to the Canadian laws, which I think are clear and fair. The only fault I find with them is that they recognise no agreements that are not in writing. . . . All you have to do is to find gold, to which you must swear, then mark off about five hundred feet along the bed of the creek where no one has laid a claim, and stick up your stakes with your name on them, one at each corner of your land. Across the ends you blaze the trees. This done, you go to the registrar of claims, pay fifteen dollars, and, after a while, the surveyor will come along and make it exact.

The British Columbia Boundary Question.

Capitalist, 21st October, 1897.

Dyea and Skagway, British or American?

It is contended on the British side that the head of the canal and the ports of Dyea and Skagway are in British territory, and this is stoutly denied by the Washington Government. The United States purchased Alaska from Russia in 1867, and the purchase, amongst other things, was subject to the provisions of a boundary convention between Great Britain and Russia made in 1825.

The Anglo-Russian convention of 1825.

The boundary between British and Russian territory was then described as follows: Whenever the summits of the mountains, which extends parallel with the coast from 56 deg. N. latitude to the point of intersection of 141 deg. W. longitude, shall prove to be at a distance of more than ten marine leagues from the ocean, the limit between the British possessions and the line of coast which is to belong to Russia shall be formed by a line parallel to the windings of the coast, and which shall never exceed ten marine leagues therefrom.

The interpretation of this clause is the nut to be cracked between the two Governments seventy-two years after the treaty was made. The Lynn channel is said to commence at least twenty leagues from the ocean. The United States claim the inlet to be the ocean, as it is tidal salt water accessible without hindrance from the sea. In pursuance of this contention the States have established custom houses at Dyea and Skagway, which on the other side are claimed to be in British territory because the Lynn channel cannot be considered as ocean at all. The United States have secured possession, which is held to be equal to nine points of the law, and from the point of view of to-day there is the prospect of a haggling for compromise.

Is land bordering upon an inlet, shore or coast?

Important, concerning Outfits.

Mr. Roger Pocock, in writing from Victoria (B.C.), to *Lloyd's Weekly* of 7th November, 1897, states:—

I do know something, at least, about outfitting for Alaska, British Columbia, and the Territories, having travelled for years in these regions, gaining experience which may be useful to next year's crop of victims.

If you are going to the Yukon do not outfit in London. A few things you may get there which will be useful:—

Pocket medicine case full of concentrated drugs and instruments of minor surgery.

"The Ship Captain's Medical Guide."

Three-cornered needles—"surgeon's," "glover's," "sailmaker's"; sheath knife, flexible with wooden handle, patent buttons, wax end, wax, thread, &c., underclothes, and toilet-gear.

For salmon—a gaff head.

For trout—common tackle. Western fish despise fancy flies.

For meat—a rifle, ·45 calibre.

Weapons are not carried on the Klondike.

It is in Canada, and the Mounted Police run that department.

Winter clothes get in Winnipeg.

Gloves are dangerous. Use mitts, and have a pair or two of guantlet wrists flexible to sew on to them. Mitts and foot gear should be of ample size, and the supply generous.

Snow goggles are necessary in spring.

A fur coat should have an eight-inch collar, and not reach below the knee. The *parka* of the Esquimaux and the fur trowsers might be got in London, and are both excellent. A fur cap and a large light fur robe for bedding will be useful. All very expensive. Fur boots are the best foot gear, but take also Canadian mocassins and shoepacks.

Snowshoes should be narrow—Pacific coast or Arctic pattern.

Summer gear.—The English oilskin suit and sou'-wester—seaman's pattern—is best; do not get officers' oilskin coats, which are too long.

For the rest the dealers in Victoria, B.C., are old miners of large experience, and their advice is worth taking.

Long-legged rubber boots are for river work, but beware of those with linings, which are useless. In wearing them put on dry socks after every meal, which will save your feet from getting tender. Hang the boots by the tops at night to dry. I prefer myself a long-legged leather boot, well oiled, because it does not wear out in a week at the ankles. The tops should be of rather light leather, narrow at the ankles, close up the leg, the sole broad with nails, the heel very low and large, the counter built up stiff, and fitting exactly over the heel. The Russian national boot is best of all; the English makes are useless, and pitifully bad; the American fair. The English hobnailed highlow is good for mountain work, but bad in the wet climate of the Upper Yukon.

The best clothes are American duck overalls, but a suit of Mackinaw, as used by lumbermen, should be taken also.

The hat should shelter the eyes.

Take the best mosquito netting, and plenty of it, also long-wristed gloves. The Yukon and Lapland are the worst mosquito countries known.

Get large grey double blankets and a waterproof sheet to roll them in; an oil canvas sack for clothes. Leave all linen and fine apparel behind.

Weight from 100 lbs.; cost, without furs, from £20.

Camp outfit for a party, buy in Canada.

An "A" tent, waterproof and strong, but light, collapsible sheet-iron stove, with telescope pipe, frying pans, camp kettles, buckets, &c., table ware of galvanised iron.

Weight from 30 lbs.; cost from £5.

Mining Outfit.—Canadian axe, with spare helves, long-handled shovel, pick, and steel gold pan.

Boat Building Outfit.—Five pound 2-in. and 4-in. wire nails, 5 lb. pitch, 3 lb. oakum, two large files, hammer, brace and bit, large whipsaw, 50 ft. ⅝-in rope, draw knife, chisel, sail canvas, sail needles, wax-end, a block or two.

Total weight, 70 lb.; cost £10.

Provisions.—Under current conditions no man is allowed to enter the country without a supply for one year. Add 1 lb. citric acid as a light substitute for lime juice (five grains dissolved in water makes a most refreshing drink), and 100 lb. dried fruit and vegetables. Scurvy is prevalent from bad living. Matches should be in tin with waterproof wrapping.

All perishable goods should be in oilskin sacks. Bags are easier to handle than boxes.

Weight of year's supply, 1,500 lb.; cost in Canada, £30.

Hints to the Mining Novice.

Here—says the *Calgary Herald* of September 16th (1897)—are a few hints for the tenderfoot who does not know dolomite from a mule tract, and who may go prospecting in the Yukon. This practical advice will be valuable to some and interesting to many.

The great majority of the men rushing to the Clondike are tenderfeet. They have never seen a gold mine, and their comprehension of what is a gold mine is derived from a perusal of the flotsam and jetsam of the daily press, says the *Vancouver World*. Few of them go prepared to buy claims already opened, and must locate claims for themselves. Brainladen with absurd ideas as to the origin of the gold, and ignorant of the natural laws of its distribution, confronted in the country with the severest physical conditions under which gold mining is followed anywhere, it is impossible but that there should be many disappointments before a sufficient number of successes shall have come to accumulate the needed experience.

On the ground, and presuming all of the possible ground of the Clondike placers already appropriated, the attention of the miner should be first given to unproven possible ground in the valleys of streams adjacent to those in which gold has already been found and to the valleys and streams which head in the same hills or mountains as do those known gold-bearing streams. It is possible for the lode system which has enriched one stream to have been cut by the drainage basin of another, so that it has enriched them as well.

In the Yukon, as elsewhere, the mountain uplifts have resulted in forming fissured and fractured zones in rocks which have filled with gold ores. These, if on one side of a mountain, are apt to be duplicated on the other, and, though neither can be seen, both can be inferred from the discovery of gold on one side of the drainage. It is justified to look on the other side as well.

As an additional guide, the gravel rock fragments in the gold-bearing stream should be compared with that being prospected. If the two contain identical rocks, and particularly if they both contain quartz, diorite, diabase or porphyry pebbles, it is worth the chance to extend the prospecting even if the first efforts disclose no gold. When gold is found in several claims in the same valley, the direction of the line of deposit should be noted and the first prospecting should be done in that line as being the most probable one for the placer.

The gold produced by the several claims going up stream should be compared, both in total quantity and size of grains. With the data of this comparison it is possible to reason out the *locus* of the richest ground, and also to know when the lode source of the gold is being approached. Coarse gold, gold with attached quartz fragments and rough gold, all indicate that the source is comparatively close at hand—that a point is being reached beyond which there will be no placer. The Russians, in their mining of the Siberian placers, failed generally to recognise the lode source of the gold, and in many instances carried their prospecting for placers miles up stream beyond the lodes from which the gold came. There is no reason for Canadian miners making the same mistake.

Another indication of nearness to lodes is the presence of rough fragments of pyrite, chalcopyrite or galena. Even if these last do not lead to gold bearing lodes, they may lead to valuable lodes of copper or lead. Generally, anything heavy that is found in the mining should be determined. Silver, quicksilver, tin and nickel ores and platinum are all worth considering, even in the Yukon. The possibility of their occurrence should not be lost sight of, the more particularly as the discovery is only to be made by following up the stream indications.

The covering of snow over the surface for seven months of the year, the covering of moss for the other

five months, precludes the possibility of prospecting by the ordinary surface methods. Where it is necessary to prospect without the guide of discoveries already made adjacent, almost total dependence must be made on the character of the pebbles in the gravels uncovered in prospecting. If much quartz be found, even though no gold at first, it is advisable to cover the possible ground for a placer pretty thoroughly before abandoning it finally.

As a general proposition, it will prove very advantageous for a dozen or more miners to co-operate in making a systematic exploration of unknown ground. Work can be done cheaper, faster and surer than by the same men acting independently. Co-operation admits of increasing the tool outfit by a blacksmith shop and drill outfit. Powder can be used and the prospect holes sunk through the frozen ground much faster than by fire. Prospecting can be spread over a much larger area by co-operation than by the same men acting each for himself. Co-operating, once the gold is found, the whole company are in a position to intelligently secure a valuable claim for each member and to get the claims so connected that they can be economically exploited as one property.

It must be remembered that the present cumbersome method of exploitation will soon be replaced by quicker and better ones, admitting of the profitable working of the ground now left unworked, and distinctly advantageous to large claims, compared with small ones.

Condensed Foods for the Far N.W. Territories.

Now, what is wanted—says the *Calgary Herald*, of September 16th (1897)—is food in such a condensed form that the equivalent in nourishment to 1,800 pounds in bulk may be so reduced in weight that a man can carry it on his back.

Science has done a great deal towards accomplishing this. The armies of the United States, England, France, and Germany, in their "emergency rations," have accomplished marvels in the matter of condensation. The U. S. War Department has proved it possible to condense a loaf of bread into a space no larger than a pack of fire crackers, a pound of beef into a hard chunk an inch or so square, a cup of coffee into a cough lozenge and a quart of soup into an oblong package of about two cubic inches. The food is all there, all its nutritive elements preserved.

Here is a partial list of things that might interest the Clondiker, and which Calgary merchants should carry in stock:—

Saccharine, a coal tar product put up in tiny tablets, 200 times as sweet as sugar.

Pemmican, a mixture of dried beef, fat and salt half a pound of which goes a long way.

Dried mixed vegetables, a French preparation of cabbages, turnips, beets and other things. One-tenth the original weight.

Dessicated beef blocks, one ounce equal to five ounces of fresh beef.

Dessicated soup, three ounces solid to a quart of water, with salt included.

Beef tablets, two ounce size, containing most of the valuable elements of a pound of beef.

Coffee lozenges, a half cup each, sugar included; tea ditto.

Kola put up with chocolate in cakes is stimulating rather than nourishing.

Malted nuts, a highly concentrated form of food, made digestible or said to be.

Lemon and Lime tablets, one, vest button size, to a glass of water. Fruit tablets of various other sorts less valuable to the miner.

Celery tablets, an appetizer a man who digs for gold will hardly take except as a luxury.

Strawberry tablets, useful mainly for flavouring.

Dessicated apples, peaches, pears, potatoes, turnips, onions, and other things—generally about one-tenth weight.

Olives, stoned and dessicated, very nutritious, a recent Californian arrangement.

Peanut meal, very light and nutritive, useful as a soup ingredient.

Bean and pea soup packages, a compressed form of the most nutritive vegetables known, combined with soup stock.

There are milk tablets which can be used, generally designed for convalescent diet, but available for general purposes,—the lactopeptines, or milk and pepsin in combination; and the melted milk tablets which are already used as condensed luncheons by a few New York men—gold miners in the Wall Street canyon. A tin can about two and a half inches high and two inches and a quarter across contains the equivalent of several meals, if allowed to dissolve on the tongue slowly.

The British sailor is called a "Lime-juicer," because lime juice is served out to him on long cruises to prevent scurvy. This disease is the bane of Arctic explorers and the bugbear of Arctic miners. The Clondike man wants plenty of lime and lemon tablets.

The Clondike man will do well to cultivate a sweet tooth, if he has it not, Sugar is one of the most condensible of foods, and is almost entirely a fuel, food and cheater of the cold. He wants oil also. He may think he doesn't, but he does. Just at this season oil doesn't appeal to a jaded palate, but the Clondike has a Russian

climate, and in Russian towns poor people used to shin up the lamp posts and drink all the oil designed for lighting the streets, until the discovery of petroleum enabled hard-hearted municipalities to substitute a brand of illuminating fluid less favoured by connoisseurs as a beverage. Nowadays, poor Russians with long memories look wistfully up at the gas lamps, shake their heads, sigh, and curse the Government.

The miner who wants to carry his own pack will have to live on nourishing soups and savoury stews a good deal of the time after reaching the Clondike. Most concentrated foods lose their fibre. There is nothing to chew on. Almost everything comes as a powder or a paste, and needs nothing but boiling water and an appetite to make a meal.

One way to get along in the Clondike region with less food is to keep warm. This is generally managed by building one's cabin right over his claim, and digging down through the frozen ground underneath. Here, in a great pit, sheltered from the wind, the miner works in a degree of discomfort, perhaps not greater than that of the Canadian lumberman out of doors. It is a useful pointer that the lumberman's favorite diet is pork and beans, and that pea soup comes next in flavour.

The Table of a Year's Food.

The accompanying table of a year's food, which may be carried into Clondike on a man's back, is based partly on Prof. W. O. Atwater's tables of food values and food needs, and upon the supposed strength of the various tablets and extracts. It is based also, in part, upon the U. S. Army Ration and other standard dietaries. It is not "guaranteed to give satisfaction," but it includes nothing that is not easily possible, and nothing which will not be one of the commonplaces of modern life within a few years. Its total weight equivalent in ordinary food is only a little over 500 lbs., but the ingredients are carefully chosen to avoid waste.

The Clondike Food Pack.

A Year's Provisions to be carried on Owner's back.

ARTICLE.	Weight lbs.	EQUIVALENT IN ORDINARY FOOD.	lbs.
War Bread	12	Bread	100
Bean and Pea Tablets	14	Dried Beans and Peas	25
		Meat Soup Stock, &c.	20
Beef, Dessicated	14	Neck of Beef, Boneless	80
Potatoes and Mixed Vegetables Dessicated and Condensed	10	Fresh Vegetables	100
Saccharine	½	Sugar	50
Milk Tablets	2	Not an exact equivalent ordinary canned Milk	40
Coffee Tablets and Saccharine	1	Coffee	10
Tea Tablets with Saccharine	1	Tea	4
Pressed Olives, stoneless, dessicated	8	Ordinary Olive	20
Lemon and Lime Tablets, almost pure acid	2	Lemons and Juice in bottles	50
Malted Nuts and Nut Meal	2	Ordinary Nut Meats	10
Celery Tablets	1	Celery	15
Dessicated Fruits	5	Canned Fruits	25
Salt, included in most of the Food Tablets	2		7
Total	69½	Total	516

These tablets with the new silk rubber suit of clothing, invented by a man in Kokomo, Ind., which is as light as air and warm as buffalo robes, simplify the problem of the argonauts. This new garment is said to be quite impervious to wind and water; to be so firm of texture that it will never wear out; and to render the conventional suit of clothes necessary only as a concession to established custom.

Termination of the Hudson Bay Company's Charter.

Thus the Company's privileges (the Hudson Bay Company) remained unchallenged till the year 1859, when the monopoly was declared illegal. But there still remained certain rights, or at least claims and vested interests, which, however, were all surrendered in 1869 to the newly constituted Dominion of Canada.

On this occasion a very profitable arrangement was made, by which the company gave up all its shadowy privileges in return for an indemnity of about £300,000, and an absolute grant of 7,000,000 acres in the most fertile part of the territory. It was also agreed that they should retain possession of all their "forts," or trading stations, with a space of 60 acres round each enclosure. By these negotiations all danger of future litigation was avoided, while hundreds of millions of acres of magnificent arable land (Manitoba, Assiniboia, &c.) were immediately thrown open for free trade and settlement, and are now traversed by the Canadian Pacific trunk line of railway. (The Early Chartered Companies, by Causton & Keane, p. 190.)

APPENDIX.

The 1896 (the 6th) Report of the Ontario Bureau of Mines.

As the London Market is said to be preparing for a Canadian boom in the Spring, a short reference to this report should not be inappropriate.

The most prominent feature in the matter of statistics is that which illustrates the progress which gold-mining is making in the Province.

The statistics for the past five years are as follows:—

Schedule.	1892.	1893.	1894.	1895.	1896.
Mines worked	9	15	4	8	8
Men above ground ..	85	112	40	126	153
Men under ground ..	40	56	52	111	86
Ore Treated (tons) ..	3,710	5,560	2,428	6,500	13,292
Gold product (oz.) ..	..	1,695	2,022	3,030	7,154
Gold value ($)	36,900	32,960	32,776	50,781	121,848
Wages paid for labour ($)	22,750	49,027	38,032	56,234	91,210

A curious feature of the above table (the "Financial News" points out) is that with 48 additional men employed in 1896 the gold output considerably more than doubled in value. At the same time, 237 men in 1896 cost in wages $91,210, although 189 in 1895 only cost $56,234—which appears to indicate that wages are on an ascending scale. The average product of the ore was $9.16 per ton, as much "lean" ore was treated, owing to lack of development work. The Mikado, of Shoal Lake, is stated to have given the best results yet obtained in the lake of the Woods region, being an average of 3.26 oz., or $48.94 per ton from a run of 297 tons treated at the reduction works at Rat Portage. This is a very handsome yield, but the report does not state whether the ore was picked or sent at random. The total number of stamps in operation last year was 45, but with new mills in course of construction pure additions to one or two of the old ones, it was believed that 130 stamps would be dropping before the end of 1897.

The foregoing table takes no account of development work going on at mines which are not yet at the crushing stage; but it appears that much capital and labour have been expended on this proving and developing of gold properties.

Until recently very few companies had been organized in the Province of Ontario to carry on mining operations. Some were working under foreign charters, but of these the number actually

engaged in the industry did not exceed half-a-dozen. In 1894—the first year which mining corporations were empowered to sell stock at any fixed price above or below par (issuing shares at a discount in this country is illegal)—only five charters were granted under the Ontario Joint-Stock Companies Acts, and the aggregate o their authorised Capital was only $2,170,000. Under the same Act, in 1896 the number formed was 22, with an authorised capital of $12,775,000 and the charters to 12 of these, representing an aggregate capital of $9,475,000 were granted during the months of November and December. In the first quarter of 1897 however, the record of 1896 has been far surpassed, 33 mining companies having been organised and chartered, with a total authorised capital of $22,665,000. These facts furnish clear evidence of the advance that has been made in the mining affairs of the province and of preparation for greater activity in the near future.

Digest of that portion referring to Mineral Wealth of the 18th Annual Report (1896-97) of the British Columbia Board of Trade.

Though the Yukon Gold discoveries have diverted attention from the Mines of British Columbia, the facts brought forward in this report prove that those who ignore the mining prospects of this Province for those wider afield and less certain will doubtless have occasion to remember the imprudence of forsaking the substance for the shadow. Take, for instance, the great and increasing value of the mineral production since 1890, carefully prepared by the very competent Mineralogist of this richly-endowed province:—

1890	$2,608,608	1894	$4,225,717
1891	$3,546,702	1895	$5,655,302
1892	$3,071,971	1896	$7,146,425
1893	$3,588,413		

The output of the mines in Kootenay during 1896 nearly doubled that of the previous year. In the Trail sub-division over 175 claims are being worked, and five have developed into mines from which regular shipments of ore are made. Some fifty mines are also in constant operation in the Slocan district, these yielding a galena containing on the average 117 ounces of silver per ton, and 52 per cent. of lead. The mines, it is computed, yielded the owners a net profit in 1896 of $75 per ton.

In the districts of Rossland, Kootenay, and Cariboo large sums are being expended in mining works, principally hydraulic; but though these districts furnish evidence of great mineral wealth, the veins carrying either silver-galena or copper-gold ores, the great cost of transportation, sixty or more miles by waggon, has retarded their development.

It does not appear that British Columbia is rich in alluvial gold, the locations being invariably metallic lodes with smelting ores, in which gold is associated with copper and silver with lead. Great efforts, however, are being made to reach the bottom of deep channels of creeks, the surface of which were worked some thirty years since. The bottoms are now being reached by shafts and tunnels. Bedrock in the channel is ascertained to be 100 ft. from the surface of the ground, but in order to reach it it has been found necessary to sink and run about 1,500 ft. of shafts and tunnels. A theory has lately been evolved that the earlier waterways of Cariboo were different from those which now exist. This has led to prospecting in what are believed to be dry beds of former rivers and creeks, and it is reported that immense quantities of gold-bearing gravel have been located.

Immediately north of Cariboo is the district of Cassiar, an immense country, very little prospected. Several of the waterways have afforded rich placer diggings. The Columbian Board of Trade also calls attention to the great value of the iron deposits of British Columbia. The output of coal during 1896 was 846,235 tons; 1,565 tons of coke were produced additional.

Another New Gold-field in British Columbia.

"The Standard" (London) of January 1st, this year, contains a lengthy report of a remarkably rich and extensive discovery of gold-bearing country in the Omenica district in the extreme north-west of the Province. The discovery was made by Mr. G. D. Wells, Mining Recorder for the Omenica division of the Cassiar district, along with two companions, Messrs. May and Lyon. "The Standard" Correspondent obtained the news directly from Mr. Wells, who states that Omenica will surpass the great placers of the Yukon. At present the returns run from $1 to $1½ to the pan. There is a depth of 8 ft. of loose gravel, which pays about $20 a day per man. The gold is very coarse, nuggets going in many cases as high as $20 in value. Mr. Wells says that the dirt will yield $4½ dollars per cubic yard.

"There is gold everywhere," Mr. Wells said to "The Standard" Correspondent. "We found traces of it in every creek along every gully and hollow. It runs in a broad belt all the way from the Kootenays in the South, right through British Columbia, the Mackenzie and Yukon Basins, to the Arctic Ocean. Besides the rich placer I have found a rich lode of free milling quartz. At Kisangas, Omenica, several enormously rich strikes have been made, some running as high as $120 to the ton; every creek in the country bears gold in paying quantities, some that will yield rich fortunes to the lucky miners. Over on Vital Creek last summer,

a Chinese Company took out $10,000 worth of pure gold by the most primitive methods of washing (Chinese are debarred by law in the Dominion from operating in underground workings). Vital Creek is only 125 miles from Hazelton, on the Skeena River, a port of call for all steamers from Victoria."

Mr. Wells produced rich samples of gold-studded quartz, and also samples of asbestos, of which, he stated, the country is very rich.

The Omenica is a wild, rugged, forbidding region—a sea of mountains. Travelling is extremely difficult, owing to the dense forests and roughness of the mountain ranges. The climate is sub-arctic, in winter registering 50 to 60 degrees below zero.

The routes to the district are along the Skeena, or up the Fraser (on to the Parsnip) Rivers from the west coast or along the Peace River from Edmonton in the south-east. The Omenica district is on the headwaters of the Peace River.

Customs Restrictions.

The Board of Trade (B.C.) has issued a report containing information upon outfitting for the Yukon. Attention is called to the fact that goods purchased in any country than in Canada must pay an average of 35 per cent. Customs duty when entering the British-Yukon.

On the other hand it must be pointed out that the Deputy-Collector of Customs at Skagway and Dyea has ruled that goods purchased in Canada and brought through these United States ports, must either pay duty or $6 a day to an official to accompany travellers to the international (?) boundary.

Projected Railway Routes to the Yukon.

From "Canadian Gazette," November 23rd, 1897.

It is interesting to note the number of railways that have been projected to reach the Klondike, or, at any rate, to facilitate travel in that direction. How many and which of them will be actually constructed is another question. Here is the list:—

Skagway and White Pass to Lake Bennett, 50 miles.
Chilkat Pass, Lynn Canal to Lake Arkell, 150 miles.
Taku Inlet to Lake Teslin, 162 miles.
Chilkoot Pass, from Dyea, Railway and Tramway, 16 miles.
Alaska Central Railway, Copper River to Klondike, 400 miles.
Stikeen River, Telegraph Creek to Lake Teslin, 135 miles.
North-Western Transportation Company's projected road over part of the Edmonton Route, 100 miles.

Short cut to the Yukon.

AN ALTERNATIVE STIKINE ROUTE.

"Financial News," 3rd January, 1898.

It is stated that the all-Canadian route viâ the Stickeen River, has, by a recent discovery, been considerably shortened. It has been proved that instead of following the Dease Lake (or the old Cassiar) trail, a cut-off can be made by proceeding up the Telegraph Creek trail to the Hootalinqua and following that river to the Hudson's Bay post at Agnell's Mountain, thence along the Shesli River on the ice to the main Taku River. Continuing along the Taku north, a branch of the Nahlin River is reached.

From this point five miles land travel is all that intervenes between the headwaters of the Teslin Lake, which, of course, is practically the headwaters of the Yukon River. This route reduces the total distance from Telegraph Creek to Teslin Lake to 130 miles, as follows:—

Telegraph Creek to Hudson's Bay Post	40
Hudson's Bay Post to Shesli River	60
Taku to Nahlin River	25
Portage	5
Total	130

This is mostly ice travel, and it is claimed that it will be found to be the best available winter route.

Yukon amended Mining Regulations.

Through Reuter's Agency, Ottawa, January 17th, 1898.

The Government has adopted amended regulations regarding placer mining in the Yukon district. Every miner and the employé of every miner, must take out a miner's certificate, the fee for which will be 10 dols., and in the case of a company 50 or 100 dols., according to the amount of capital stock. The miner's license confers the right to mine, fish, hunt and cut timber. The general size of mining claims is 250 feet, and of discoverer's claims 500 feet. Every alternate ten claims are reserved by the Government.

Subaqueous mining leases will be issued in five mile sections, at a fee of 100 dols. per mile per annum, and the usual royalty. The fee for recording and renewing mining claims is 15 dols. Five miners working more than 100 miles distant from the office of the recorder may appoint a recorder to record the claims. A royalty of 10 per cent. on the gold mined will be collected by the Government, but provision will be made for the exemption on the annual product of any mining claim up to 2,500 dols., so that claims which do not produce more than 2,500 dols. a year will not be liable for royalty.

Provisions will be made to prevent speculation in claims by throwing a claim open to entry which has not been worked for a certain number of days, unless reasonable cause be shown to account for it.

*Extracts from Reports by U.S. Mining and Geological Experts.

Professor N. S. Shaler, who is the best living American authority on geology has been telling his classes at Harvard for the last twenty years that the coming great discoveries of gold on this continent would be in Alaska and the North-West. He explained that in the great extension of the Rocky Mountain system to the North doubtless lay the mother vein, which sooner or later would come to light. Professor Shaler's prophecy, based on scientific deductions, has come true, and other scientists agree with him that the Alaskan country contains limitless possibilities for the discovery of gold.

Dr. W. H. Dael, of the Smithsonian Institution at Washington, who has for years been regarded as the highest authority on the Alaskan country, and who is a geologist of note, says he has no doubt of the truth of the stories told of the richness of the Yukon soil. "The gold-bearing belt of North-Western America," he says, "contains all the gold fields extending into British Columbia and what is known as the North-West Territories and Alaska. The Yukon really runs along in that belt for five hundred or six hundred miles. The bed of the main river is in the valley. The yellow metal is not found in paying quantities in the main river, but in the small streams which cut through the mountains on either side."

George Frederick Wright, professor of geology at Oberlin College, thinks that the "mother lode" may be looked for successfully in Alaska. In his opinion it exists somewhere up the streams on which the placer mines are found. The source of the Klondyke gold, he says, is from the south, and the gold was doubtless transported by glacier action. The Klondyke region is on the north side of the St. Elias Alps, and the glaciers flowed both north and south from these summits. "Placer mines," says Professor Wright, "originate in the disintegration of gold-bearing quartz veins, or mass like that at Juneau. Under sub-aerial agencies these become dissolved. Then the glaciers transport the material as far as they go, when the floods of water carry it on still further. Gold, being heavier than the other materials associated with it, lodges in the crevices or in the rough places at the bottom of the streams. So to speak, nature has stamped and 'panned' the gravel first and prepared the way for man to finish the work. The

* I am indebted to Mr. Ironmonger Sola for these extracts.

amount of gold found in the placer mines is evidence not so much, perhaps, of a very rich vein as of the disintegration of a very large vein, What the prospectors have found points to more. The unexplored region is immense. The mountains to the south are young, having been elevated very much since the climax of the glacial period. With these discoveries and the success in introducing reindeer, Alaska bids fair to support a population eventually of several millions."

William Van Slooten, an eminent mining engineer and metallurgist, sees in the reports from the Klondyke indications of a more extraordinary deposit of gold than that of California. He says:—"No such specifically large amounts of gold were taken out by individuals during any similar period of California gold hunting. Two months of work in the water has realized more than any six months heretofore known in the history of gold mining. We had long been aware that there was gold in the Yukon basin, but the total output for the last ten years before the Klondyke developments amounted to not more than a million dollars' worth at the utmost. Now, within two months, five millions have been taken out of the Klondyke regions. It took the first eight months of work in California to pan out that amount under infinitely more favourable conditions of climate and weather. That is a straw worth noting."

The latest and therefore the most important official investigation of the gold fields is that conducted under the auspices of the United States Geological Survey in 1896 by J. Edward Spurr, accompanied by two geologic assistants. The expedition was sent out in accordance with an appropriation by Congress of $5,000 for the investigation of the coal and gold resources of Alaska. A like appropriation for the year before resulted in the expedition headed by Dr. George F. Becker, which investigated the gold fields of Southern Alaska. Mr. Spurr's party crossed the Chilkoot Pass about the middle of June, and passed down the Yukon in a small, roughly-built boat to the crossing of Forty Mile Creek. A summary of his report was submitted to Congress by the director of the Geological Survey through the Secretary of the Interior, February 2nd, 1897. Mr. Spurr's party and Dr. Becker's both took numerous photographs along the routes they traversed. It appears from Mr. Spurr's report that the gold belt is likely to be found running in a direction a little west of north-west.

Running in a direction a little west of north-west through the territory examined is a broad, continuous belt of highly altered rocks. To the east this belt is known to be continuous for one hundred miles or more in British territory. The rocks constituting this belt are mostly crystalline schists associated with marbles and sheared quartzites, indicating a sedimentary origin for a large part

of the series. In the upper part a few plant remains were found, which suggest that this portion is probably of Devonian age. These altered sedimentary rocks have been shattered by volcanic action, and they are pierced by many dikes af eruptive rock. Besides the minor volcanic disturbances, there have been others on a large scale, which have resulted in the formation of continuous ridges or mountain ranges. In this process of mountain building the sedimentary rocks have been subjected to such pressure and to such alteration from attendant forces that they have been squeezed into the condition of schist, and often partly or wholly crystallized, so that their original charcter has in some cases entirely disappeared. In summarizing, it may be said that the rocks of the gold belt of Alaska consist largely of sedimentary beds older than the carboniferous period; that these beds have undergone extensive alteration, and have been elevated into mountain ranges and cut through by a variety of igneous rocks.

Throughout these altered rocks there are found veins of quartz often carrying pyrite and gold. It appears that these quartz veins were formed during the disturbance attending the uplift and alteration of the beds. Many of the veins have been cut, sheared and torn into fragments by the force that has transformed the sedimentary rocks into crystalline schist; but there are others, containing gold, silver and copper, that have not been very much disturbed or broken. These more continuous ore-bearing zones have not the character of ordinary quartz veins, although they contain much silica. Instead of the usual white quartz veins, the ore occurs in a sheared and altered zone of rock and gradually runs out on both sides. So far as yet known, these continuous zones of ore are of relatively low grade. Concerning the veins of white quartz first mentioned, it is certain that most of them which contain gold carry it only in small quantity, and yet some few are known to be very rich in places, and it is extremely probable that there are many in which the whole of the ore is of comparatively high grade.

No quartz or vein mining of any kind has yet been attempted in the Yukon district, mainly on account of the difficulty with which supplies, machinery and labour can be obtained; yet it is certain that there is a vast quantity of gold in these rocks, much of which could be profitably extracted under favourable conditions. The general character of the rocks and of the ore deposits is extremely like that of the gold-bearing formations along the southern coast of Alaska, in which the Treadwell and other mines are situated, and it is probable that the richness of the Yukon rocks is approximately equal to that of the coast belt. It may be added that the resources of the coast belt have been only partially explored.

Besides the gold found in the rocks of the Yukon district there is reason to expect paying quantities of other minerals. Deposits of silver bearing lead have been found in a number of localities, and copper is also a constituent of many of the ores.

Since the formation of the veins and other deposits of the rocks of the gold belt an enormous length of time has elapsed. During that time the forces of erosion have stripped off the overlying rocks and exposed the metalliferous veins at the surface for long periods, and the rocks of the gold belt, with the veins which they include, have crumbled and been carried away by the streams, to be deposited in widely different places as gravels, or sands, or muds. As gold is the heaviest of all materials found in rock, it is concentrated in detritus which has been worked over by stream action; and the richness of the placers depends upon the available gold supply, the amount of available detritus, and the character of the streams which carry this detritus away. In Alaska the streams have been carrying away the gold from the metalliferous belt for a very long period, so that particles of the precious metal are found in nearly all parts of the Territory. It is only in the immediate vicinity of the gold-bearing belt, however, that the particles of gold are large and plentiful enough to repay working, under present conditions. Where a stream heads in the gold belt, the richest diggings are likely to be near its extreme upper part.

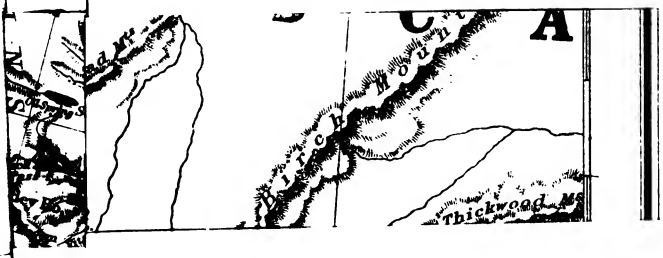
In this upper part the current is so swift that the lighter material and the finer gold are carried away, leaving in many places a rich deposit of coarse gold overlain by coarse gravel, the pebbles being so large as to hinder rapid transportation by water. It is under such conditions that the diggings which are now being worked are found, with some unimportant exceptions. The rich gulches of the Forty Mile district and of the Birch Creek district, as well as other fields of less importance, all head in the gold-bearing formation.

A short distance below the heads of these gulches the stream valley broadens and the gravels contain finer gold more widely distributed. Along certain parts of the stream this finer gold is concentrated by favourable currents and is often profitably washed, this kind of deposit coming under the head of "bar diggings." The gold in these more extensive gravels is often present in sufficient quantity to encourage the hope of successful extraction at some future time, when the work can be done more cheaply and with suitable machinery. The extent of these gravels which are of possible value is very great. As the field of observation is extended farther and farther from the gold-bearing belt, the gold occurs in finer and finer condition, until it is found only in extremely small flakes, so light that they can be carried long distances by the current.

It may be stated, therefore, as a general rule, that the profitable gravels are found in the vicinity of the gold-bearing rock.

The gold-bearing belt forms a range of low mountains, and on the flanks of these mountains, to the north-east and to the south-west, lie various younger rocks which range in age from carboniferous to very recent tertiary, and are made up mostly of conglomerates, sandstones and shales, with some volcanic material. These rocks were formed subsequent to the ore disposition, and therefore do not contain metalliferous veins. They have been partly derived, however, from detritus worn from the gold-bearing belt during the long period that it has been exposed to erosion, and some of them contain gold derived from the more ancient rocks and concentrated in the same way as is the gold in the present river gravels. In one or two places it is certain that these conglomerates are really fossil placers, and this source of supply may eventually turn out to be very important.

In the younger rocks which overlie the gold-bearing series there are beds of black, hard, glossy, very pure lignitic coal. An area of these coal-bearing strata lies very close to the gold-bearing district, in the northern part of the region examined, and as the beds of coal are often of considerable thickness and the coal in some of them leaves very little ash and contains volatile constituents in considerable amount, it is probable that the coal deposits will become an important factor in the development of the country.


Thickwood